THE AMERICAN JOURNAL OF PHARMACY.

DECEMBER, 1889.

OLEATES.

BY G. M. BERINGER, PH. G.

Read at the Pharmaceutical Meeting, November 19.

Historical.—The medicinal application of the oleates was proposed by Professor John Marshall, of London (see AMER. JOUR. OF PHAR., 1872, p. 317). He claimed that the oleate of mercury containing the mercury in solution in a solvent remarkable for its diffusibility and penetrating properties, was quickly absorbed, promptly producing the effect of the mercury. Numerous metallic oleates and solutions of the alkaloids in oleic acid were soon tried by various investigators, and a series of valuable papers contributed in the various pharmaceutical and medical journals mark the progress of our knowledge in this direction. Among the more notable being the papers of Dr. L. Wolff (AMER. JOUR. OF PHAR., 1881, p. 545), Dr. J. V. Shoemaker (*Med. and Surg. Report.*, May 13, 1882), and H. B. Parsons (*Drug. Circ.*, 1885, p. 2), who furnished a series of formulas which have been made the basis of the formulas for the oleates of the National Formulary.

The oleates as originally proposed were prepared by dissolving the oxides of the various bases in oleic acid, and the oleates recognized by the United States and British Pharmacopœias are thus prepared. Unfortunately, as thus prepared they are not, as a rule, as permanent or as acceptable as those obtained by double decomposition. The oleates as now prepared by the manufacturing pharmacists are largely true oleates or oleo-palmitates or oleo-stearates of the bases prepared by double decomposition, and it is hoped by the writer that in the next revision of the Pharmacopœia formulas for such will be introduced.

The oleates which have withstood the test of therapeutical experiments and are still prescribed are the oleates of zinc, mercury, copper, lead and bismuth, and the alkaloidal solutions the so-called oleates of aconitine, cocaine, morphine, veratrine and quinine.

It is not the object of the present communication to present an entirely original line of thought, but to record a few observations on this subject and to furnish working formulas for those oleates which the pharmacist is called upon to dispense, and which will undoubtedly claim the attention of the Committee of Revision of the Pharmacopœia in 1890, and to call particular attention to a few points in manipulation which are essential to note in order to obtain good products.

First, it is to be observed that the character of the product is materially altered by the concentration of the solutions used and the temperature at which the precipitation is accomplished. The same strength of solutions will not answer for all of the oleates, nor can a uniform temperature be adopted for their precipitation.

Secondly, neutral solutions or only slightly acid solutions of the metallic salts can be used, a strongly acid solution decomposing the oleate of potassium or sodium used, with the liberation of oleic acid. On the other hand, an alkaline oleate solution will yield a product more or less contaminated with a hydrate of the base.

It was proposed by Dr. J. V. Shoemaker (*loc. cit.*) and also by H. B. Parsons (*loc. cit.*) to use a solution of Castile soap as a precipitant. The Castile soap of the market is of questionable composition, varying considerably and usually yields a solution with water which clears or subsides but slowly, and is filtered with difficulty. It seems, therefore, to me advisable to replace this with a solution of oleate of potassium or sodium prepared by saponification of oleic acid with an alkali.

The preparation of a neutral soap with an aqueous solution of alkali is difficult, the attempt resulting in a decidedly alkaline solution. If an acid oleate of the alkali is produced it will produce a cloudy solution which will not filter readily (the acid oleates of the alkalies being insoluble). For these reasons hydro-alcoholic solutions of the alkaline hydrate are used, by which means a perfectly neutral soap can be procured, which can be easily diluted with water and the solution filters easily through paper. Experiments showed that the quantity of alcohol necessary can, with proper manipulation, be reduced to comparatively a small amount.

Acidum Oleicum is stated by the U. S. Pharmacopœia to have a specific gravity 0·800 to 0·810. The U. S. Dispensatory, page 89, states that this is an error, and should be 0·900 to 0·910. Gmelin (vol. xvii, p. 64) quotes Chevreul as authority for specific gravity 0·898. The British Pharmacopœia states ·860 to ·890. While Allen (Commerc. Organic Analysis, vol. ii, p. 233) states that the pure acid "has a density of ·897 at 19° C.," and calls attention to an error in Watt, who quotes Chevreul as ·808 and says, "the same mistake is made by Wurtz and other industrious compilers and copyists." The oleic acid for pharmaceutical purposes need not be a chemically pure acid. In fact, for many oleates, notably for bismuth oleate, it is desirable to have present a small amount of stearic acid. Purified red oil answers admirably for all medicinal oleates. According to Chas. Rice (AMER. JOUR. PHAR., 1873, p. 1), such a purified acid exhibits a specific gravity of ·895 at 62° F. E. C. Saunders (*New Remedies*, June, 1880), reports ·897, while Dr. Squibb (*Ephemeris*, 1882, p. 158) states the specific gravity at ·898. Several commercial samples recently examined showed specific gravities of 0·8991, 0·8992, 0·909, at 60° F. Another sample was semi-solid at 60° F., so the specific gravity was taken at 66° F. and found to be 0·8854. Another sample received from the manufacturer without subsequent purification had a gravity of ·8846 at 60° F. The first and second were light in color and contained but small quantities of other acids. The third was very dark colored and the fourth, while of a paler color, contained a large excess of solid acids. These figures indicate that the correct specific gravity should be 0·890 to 0·900. The first acid was the one used for the experiments here recorded:

Zinci Oleas.

Oleate of zinc, $Zn(C_{18}H_{33}O_2)_2$.

Take of—

Oleic acid....	1,000 grains.
Soda[1]	160 " or q. s.
Alcohol	6 fluidrachms.
Zinc sulphate	550 grains.
Water, a sufficient quantity.	

Warm the oleic acid in a capacious vessel on the water-bath to a temperature of 60° to 66° C. (140° to 150° F.), and having dissolved the soda in a mixture of the alcohol and two fluidounces of

[1]The granular soda, known as Banner lye, containing about 90 per cent. of soda, was found to answer well for this purpose.

water, slowly add the soda solution, stirring constantly until the acid is entirely neutralized, and a small portion of the resulting soap dissolved in alcohol yields but a faint pink tint on the addition of a few drops of alcoholic solution of phenol phthaleine. Dissolve the resulting soap in three (3) pints of warm water and filter if necessary. Dissolve the zinc sulphate in one (1) pint of water and filter. Warm the solutions to 43° C. (110° F.), and slowly add the zinc sulphate solution to the soap solution, stirring constantly. Collect the precipitate on a moist filter, wash thoroughly with distilled water and finally dry on bibulous paper at a temperature not exceeding 38° C. (100° F.).

In the above formula, there is ordered an excess of zinc sulphate as this tends to more readily separate the oleate produced. It is important that the temperature of the solutions on precipitating should be maintained at 100°–110° F. At this temperature the oleate on drying is obtained in white friable masses to powder which it is only necessary to rub through a sieve. If a temperature much lower than this is used the resulting oleate is in curdy masses which are glutinous to the touch and almost impossible to pulverize. If precipitated at a higher temperature the result is a fused mass of oleate of a greasy nature, which can only be dried and pulverized with difficulty and the resulting powder is gritty. As thus obtained, oleate of zinc is a nearly white, impalpable, unctuous, slippery powder, fusing at 75° C., very soluble in ether, carbon bisulphide, chloroform, and benzol, somewhat less soluble in turpentine, petroleum ether and alcohol.

The yield was 1,122 grains, theoretical yield being 1,115 grains. The excess most likely being due to water retained at 100° F.

Plumbi Oleas.

Oleate of Lead, $Pb(C_{18}H_{33}O_2)_2$.

Take of—

Oleic acid	1,000	grains.
Soda	160	" or q. s.
Alcohol	6	fluidrachms.
Lead acetate	675	grains.
Water, a sufficient quantity.		

Saponify the oleic acid as directed in the formula for zinc oleate, and dissolve the resulting soap in three (3) pints of warm water and filter. Dissolve the lead acetate in two pints of water, adding a few drops of acetic acid if necessary to produce a clear solution, and filter. Warm the solutions and add the lead acetate solution slowly to the soap solution, stirring constantly. Collect the mass on a strainer, wash and dry.

Oleate of lead thus prepared is a buff-colored firm mass, fusing at 65° C., forming an entirely clear liquid at 68° C., and is very soluble in carbon bisulphide, chloroform, ether, petroleum ether and benzol, sparingly in turpentine and alcohol. There is but little use for this oleate, as the officinal lead plaster and diachylon ointment are practically preparations of lead oleate and sufficient for its exhibition.

Cupri Oleas.

Oleate of Copper, $Cu(C_{18}H_{33}O_2)_2$.

Take of—

Oleic acid	1,000 grains.
Soda	160 " or q. s.
Alcohol	6 fluidrachms.
Copper sulphate	442 grains.

Water, a sufficient quantity.

Saponify the oleic acid as directed in the formula for zinc oleate, and dissolve the resulting soap in three (3) pints of water. Dissolve the copper sulphate in one pint of warm water and filter. Warm the solutions to about 140° to 150° F., and slowly add the copper solution to the oleate of soda solution, stirring constantly; warm until the copper oleate fuses into a mass, decant the clear supernatant liquid, wash several times with warm water, and finally dry on the water-bath.

Yield, about 1,100 grains, theoretical yield 1,108.

Oleate of copper, as thus produced, is a bright green waxy mass, fusing at 49° C., very soluble in carbon bisulphide, chloroform, benzol, ether, turpentine, petroleum ether, absolute alcohol, alcohol and fixed oils.

Hydrargyri Oleas.

Oleate of Mercury, $Hg(C_{18}H_{33}O_2)_2$.

The oleate of mercury is perhaps the oleate most frequently prescribed, and which, made in accordance with the Pharmacopœia by dissolving the oxide in oleic acid, is a very unstable compound. The very excess of oleic acid being the prime factor in causing its decomposition. Several writers have proposed to make the officinal oleate a twenty per cent. solution of the oxide in oleic acid. This, while a more stable preparation than the present officinal ten per cent. solution, is more susceptible of change than a true oleate made by double decomposition. It seems to me to be far better to make the officinal a true oleate in composition as well as in name. Dr. J. V. Shoemaker (*loc. cit.*) proposed to make such an oleate of mercury by decomposing oleate of soda solution by means of mercuric chloride, the solutions

being mixed and boiled until the resulting oleate furnished a mass. The long boiling always resulted in a partial decomposition of the oleate, more or less of the mercury being reduced. H. B. Parsons (*loc. cit.*) proposed the decomposition of potassium oleate by means of a solution of mercuric nitrate. Mr. Louis Dohme (AMER. JOUR. PHAR., 1873, p. 158) proposed a similar formula. With proper care this method will yield good results. The following is the formula I have used:

Take of—

Oleic acid	1.000	grains.	
Potassa	220	"	or q. s.
Red oxide of mercury	383	"	
Nitric acid	323	"	or q. s.
Alcohol	6	fluidrachms.	
Water, a sufficient quantity.			

Saponify the oleic acid with the potassa as directed in the formula for zinc oleate, and dissolve the resulting soap in two pints of warm water and filter. Mix the nitric acid with the two fluidounces of water, heat to boiling and add the mercuric oxide previously reduced to powder. Boil until it is entirely dissolved, adding, if necessary, a few drops of nitric acid additional. Dilute the solution of mercuric nitrate with four fluidounces of water. Warm both solutions to 66°C. (150°F.) and add the oleate of potassium solution to the mercury solution, stirring constantly. Decant the aqueous solution and wash the precipitate with warm water not exceeding 150°F. If precipitated at a much lower temperature it will be necessary to heat the mixture to near boiling in order to form a mass of the precipitate, which heating is almost certain to result in a partial decomposition of the oleate. The same is apt to result if the solutions are mixed at a higher temperature. In connection with this we recall the experiments of Chas. Rice, who proved that as the temperature was advanced in preparing oleate of mercury the quantity of oxide reduced greatly increased. (AMER. JOUR. PHAR., 1873, p. 1).

The yield by the above formula was 1,329 grains, theoretical yield being 1,350 grains. Oleate of mercury as thus prepared is about the color of a very pale citrine ointment and of somewhat softer consistency, fuses at 66° C. (150° F.), yielding an entirely clear fluid at 70°C. It is very soluble in carbon bisulphide, chloroform, ether and turpentine, and yields an opalescent solution in benzol and petroleum ether, and is slightly soluble in absolute alcohol and alcohol.

The aqueous solution decanted from the precipitate gave no indications of mercury with solution of potassa or potassic iodide, proving the complete precipitation of the metallic salt.

The sample shown, marked No. 1, was prepared over four months ago, and has been purposely kept in a warm part of the store in a flint vial, the stopper being occasionally removed. The surface exposed to the light now shows a reduction of the mercury, which was not very marked until three months of summer weather had elapsed since the preparation. The second sample was prepared about a week ago.

Bismuthi Oleas.

Oleate of Bismuth, $Bi(C_{18}H_{33}O_2)_3$.

The most difficult oleate to prepare by double decomposition is the bismuth oleate. The tendency of bismuth solutions to precipitate oxy salts unless in decidedly acid solutions, and the decomposition of the oleate solution used by the acid solution renders it almost impossible to thus make this oleate. Mr. H. B. Parsons (*loc. cit.*) attempted to overcome this difficulty by using a solution of crystallized nitrate of bismuth in glycerin. Even this is apt to yield unsatisfactory results. I have obtained more satisfactory results by saponifying the acid with oxide of bismuth. On heating oxide of bismuth with oleic acid but a very small portion is dissolved; on boiling them together with water, however, saponification takes place. Owing to the variability of commercial subnitrate of bismuth (see AMER. JOUR. PHAR., 1888, p. 385) good results were not obtained by taking a definite weight of that salt and precipitating the hydrated oxide from its solution in nitric acid. The quantity of hydrate varied so much as to yield on boiling with the calculated quantity of oleic acid an oleate of too soft a consistence. For these reasons I prefer to use an oxide dried at 212°F.

The following is the formula I prefer.

Take of—
Bismuth oxide dried at 100° C. (212° F.) until it ceases to lose water...1 troy oz.
Oleic acid...3 troy oz. and 295 gr.
Water, a sufficient quantity.

Rub the oxide of bismuth to a fine powder, and thoroughly mix it with the oleic acid in a capacious vessel, add two pints of water and boil the mixture, replacing the water as it evaporates, and stirring frequently until complete saponification has taken place and a small quantity of the mass dropped into cold water yields an ointment-like

mass without any separation of oleic acid. Decant the water from the oleate and work the mass with a horn or wooden spatula to free it from retained water.

Bismuth oleate thus prepared is a cream colored mass about the consistence of an ointment, softening at the temperature of the body and fusing at 58° C. It is easily decomposed by contact with metals, and is but very slightly soluble in the usual solvents for oleates.

COMMERCIAL TAR.

By R. G. Dunwody.

Contribution from the Chemical Laboratory of the Philadelphia College of Pharmacy.—No. 62.

Tar, as found and used in the United States, is the product of the incomplete combustion of the fat pine or *Pinus palustris* and some other pine species. North Carolina produces most of the tar exported from this country, although small quantities, especially for home consumption, are manufactured in South Carolina, Georgia, and several other of the Southern States. There are at least three methods by which tar is made, perhaps the simplest being that in which the wood is cut into short lengths, split, and the pieces wedged vertically into an iron pot so as to project some distance above the vessel. The whole is then inverted over another iron pot and the wood ignited, the flame rises around the outside of the pot, melting the resin in the wood which is partly burned on reaching the flame and drops down into the vessel below. This process is employed by pharmacists and others who wish to produce a small quantity of tar for their own use.

A second method adopted for the same reasons consists in cutting the wood into lengths of two to three feet, splitting to a diameter of about two inches and placing a number of these at the top of an inclined plane of sheet iron ; on igniting the wood the tar runs down the plane and is collected below. The third method is used in preparing larger quantities and consists in cutting the wood into lengths of two to three feet, splitting it into billets and arranging the end in a pile six to eight feet diameter, covering with bark and then with clay. A fire is then kindled on top, the fuel being some of the poor pieces of pine and when the whole becomes heated, the tar runs off below through an iron pipe previously inserted for the purpose. The first two pro-

cesses are very wasteful and the product is much darker than that prepared by the last method, which yields a lighter colored product of a very characteristic tar odor.

Living in the State of Georgia and in a locality to see something of the manufacture of tar by the above mentioned processes, I procured a sample made by the third method, which nearly represents the commercial article. I was also supplied by Mr. Fletcher with a sample made by the first process, from his locality, near Little Rock, Arkansas. A third sample—"North Carolina pure pine tar, refined and especially adapted for medicinal or any other purposes," put up and sold by Mr. Good, of Philadelphia—was procured from the College Cabinet, and examined with the other two. It is labelled as coming from North Carolina. An account of the method used in refining it may be found in the AMER. JOUR. PHAR., 1889, page 234, by Dr. C. B. Lowe.

The three samples were first spread in thin layers on glass. On holding towards the light the refined tar was found to be smooth and amorphous, while the other two samples were shown to be largely composed of granular transparent masses, which under the microscope assumed a crystalline form, showing brilliant effects with polarized light. These crystals, according to Flückiger (*Pharmacographia*, 2d ed., page 622), are pyrocatechin. The specific gravity of the refined tar was found to be 1·040, that from Georgia 1·083, and the sample from Arkansas 1·090. The average specific gravity of tar from coniferæ is said to be 1·060. None of the samples were completely soluble in petroleum ether (b. p. 25°–40° C.). All were soluble in 95 per cent. alcohol, absolute alcohol, ether, and chloroform. All were acid to litmus paper and imparted an acid reaction to water. Ten grams of each sample were digested with water for forty-eight hours, the clear aqueous solutions, which had become yellow in color, was separated, agitated with ether, and the ether allowed to evaporate spontaneously, when a brown somewhat oily residue was obtained in every case. The residue was nearly completely soluble in water, and the aqueous solutions when treated with ferric chloride gave greenish colors, with ferric acetate darker colors, with ferrous sulphate no change, with calcium hydrate red-brown colors, and with gelatin no change. These tests all indicate the presence of pyrocatechin, and judging by the colors it was most abundant in the Arkansas and Georgia tar, and almost absent in the refined tar. The remaining

aqueous solutions left after making the above tests were allowed to evaporate spontaneously over sulphuric acid and deposited a somewhat crystalline residue, most marked in the Georgia sample and least in the refined sample. No sediment was found in any of the samples, and they dissolved completely without leaving sand, chips, or clay behind.

It is suggested that this refined tar had lost much of the pyrocatechin through contact with water.

It appears from the above results that the best method of examining a sample of tar would be to take its specific gravity, try its solubility with the above solvents, and examine the ethereal solution of the aqueous extract for pyrocatechin. Comparing a thin layer on glass with a sample of known purity, a microscopic examination would also be of value in determining the quality of a sample.

CONTRIBUTION TO THE KNOWLEDGE OF BORON.

By Henry C. C. Maisch, Ph.G., Ph.D.

During his researches on the electrolysis of the alkaline oxides and hydroxides, Sir H. Davy also subjected boric acid to the action ot the electric current (*Phil. Trans. Royal Society*, 1808, p. 43). He obtained a black combustible substance, which, however, he did not further describe. Without doubt he was the first to obtain boron in the free state, though to two French chemists, Gay Lussac and Thénard (*Gilb. Ann. der Phys.*, 1808, p. 30), belongs the credit of first describing the element, which they obtained by the action of potassium on melted boric acid. During the year 1888, W. Hampe (*Chem. Zeit.*, xii, 841) prepared boron by the electrolysis of borax, which he melted in a graphite crucible.

Wöhler and Deville (*Ann. Chim. Phys.*, 1858 (3), lii, p. 84) during their classic researches on boron and its compounds employed the process of Gay-Lussac and Thénard, using potassium or sodium, but they also found that by using aluminium crystalline boron was obtained.

We are indebted to Berzelius for two further methods: (1) by the action of potassium on boron fluoride, and (2) by the action of potassium borofluoride at the fusing point of the former. Wöhler and Deville (*l. c.*) and Geuther (*Jenaische Zeitschr. für Med. und Naturw.*,

ii, p. 209) found that in place of potassium or sodium, magnesium could be used to advantage in the last method.

On the advice of Prof. L. Gattermann, I took up the reduction by means of magnesium, using in place of potassium borofluoride the cheaper borax. This was employed in the form of powdered borax glass because the water of crystallization otherwise present would have an injurious effect on the reaction.

Without going into details as to the experiments made with the idea of finding the best proportion of the reagents to be used, I will simply give the one which was found to be the best. The bottom of a hessian crucible was covered with the powdered borax glass, on this an intimate mixture of two parts borax and one part magnesium powder was packed, so as to drive out as much air as possible, and this was covered by about half an inch of powdered borax glass, which is to fill the crucible. The lid is then fastened down with moist clay and the whole subjected to the heat of a well-drawing charcoal furnace, the crucible being surrounded by the fuel, which is allowed to burn down once. After cooling, the crucible is broken and the product finely pulverized. The powder is extracted with boiling water, and, after cooling, thrown in small portions into cooled diluted hydrochloric acid and allowed to remain for four or five hours, after which it is filtered off and subjected to the action of concentrated hydrochloric acid for about two hours. The powder is then filtered off, washed with water and dried either by the heat of a water bath or by the following method: The water is replaced with alcohol, this in turn by ether, and this allowed to evaporate at the temperature of the room. The boron thus obtained is by no means pure, but answers perfectly well for the preparation of its halogen derivatives.

Boron trichloride.—The first method to be found in literature is that of Berzelius (*Pogg. Ann.*, 1824, ii, p. 147) who states that amorphous boron which has been dried in a vacuum ignites in an atmosphere of chlorine at ordinary temperatures, while boron which has been heated reacts only at higher temperatures. Some decades later Wöhler and Deville (*l. c.*) showed that the same takes place in hydrochloric acid gas; the reaction, however, must be completed at higher temperatures. They also found that by the action of boron on mercuric chloride, lead chloride, or silver chloride this compound was likewise obtained.

The method which has been used up to the present for the preparation of the chloride is that of Dumas (*Ann. Chim. Phys.*, 1826, xxxi,

p. 466; xxxiii, 376), who allowed chlorine to pass in a tube over a heated mixture of powdered melted boric acid and charcoal.

It seemed to be of interest to ascertain how the boron prepared by the above method would behave towards chlorine. The apparatus which was used was the following: A hard glass tube, as used for combustions, about 4 to 8 inches longer than the combustion furnace to be used, is drawn out at one end and bent almost at right angles. This part is attached to a Peligot's tube, which is surrounded by a freezing mixture of ice and salt. All the necessary joints are made by means of smooth and closely-fitting corks. The air-dry boron is loosely spread in the combustion tube, so that it is one-fourth inch in thickness all through; and as the boron must be thoroughly dry the water is driven out by heating in a stream of hydrogen, also allowing it to cool in the same. Carbonic acid cannot be used, as boron reduces it completely to carbon monoxide, as noticed by Lorenz (*Ann. Chem.*, 1889, ccxlvii, p. 226). After the tube has cooled the hydrogen is forced out by a stream of dry air, and the larger end of the tube then connected with a chlorine generator. The chlorine is prepared from manganese dioxide and hydrochloric acid, and best regulated so that a slow but steady stream is obtained. The whole apparatus is filled with washed and dried chlorine gas before heat is applied, sufficient for producing a slight glow in the tube. A liquid having the color of chlorine gas condenses in the Peligot's tube, which is best connected with a good drawing chimney, as some of the trichloride goes through uncondensed. The color of the liquid is due to dissolved chlorine, which is removed by shaking the liquid with mercury in a sealed tube, which can also be used for distilling. After the liquid has become perfectly colorless, which takes about two days, the tube is opened and by means of a closely-fitting cork a narrow glass tube, twice bent at right angles, is attached. The one arm of the tube which is used as a condenser is to be about 20 inches long and projects to the bottom of the receiving vessel, which is surrounded by a freezing mixture of ice and salt. The best receiver is a wide glass tube about 25 inches long and about 5 inches below the orifice drawn out, so that the condensing tube just moves freely in the opening. The distillation is best carried on by means of warm water, very slowly, so as not to lose too much of the chloride—this boiling at 18° C. The yield of the chloride by this process is as follows: By using 8 gms. of magnesium powder for reduction the boron gave 15 gms. of the chloride, the theoretical yield being 26 gms.

ANALYSIS OF BLACKBERRY BARK.

BY GUSTAV ADOLF KRAUSS, PH. G.

Abstract from an Inaugural Essay.

The results of the anylysis of the root bark of *Rubus villosus* are given in the following table:

Treatment with

Petroleum ether	Volatile oil	0·015	
	Wax and bitter principle	0·015	
	Fixed oil	0·230	
			0·26
Absolute ether	Gallic acid	0·370	
	Resin soluble in alcohol	0·650	
	Resin insoluble in alcohol	0·050	
			1·07
Absolute alcohol	Phlobaphene	0·870	
	Tannin	6·530	
	Extractive	4·100	
	Villosin	0·800	
	Glucose	0·420	
			12·72
Distilled water	Mucilage	2.260	
	Dextrin	2·500	
	Other carbohydrates	4·220	
	Tannin	4·900	
	Other compounds precipitated by lead acetate	0·550	
	Glucose	1·250	
	Saccharose	0·170	
			15·85
Soda solution	Pectin and albuminoids	0·600	
	Phlobaphene	0·800	
			1·40
Weak HCl	Pararabin etc	4·800	
	Starch	3·580	
			8·38
Chlorine	Incrusting matter		18·00
HNO_3 and $KClO_3$	Intercellular matter		17·00
Residue	Cellulose and sand (1·35)		16·48
Ash			3·16
Moisture			10·60
Loss			0·08
			100·00

In the examination of the alcoholic extract evidence having been obtained of the presence of a glucoside, numerous experiments were made with the view of isolating it; the following deserve to be mentioned:

The aqueous solution of the alcoholic extract was freed from tannin by means of lead acetate, the filtrate treated with H_2S, and the clear liquid evaporated; decomposition took place with the production of an insoluble resin-like body.

The alcoholic percolate of the drug was macerated with freshly precipitated ferric hydrate; the latter, prepared from 500 cc. of solution of tersulphate of iron, is used for the tincture from 500 gm. of bark. The alcoholic filtrate, to which the washings have been added, is subjected to distillation until the alcohol has been completely removed; the cloudy residue is filtered and the filtrate, mixed with absolute ether and frequently shaken, is set aside for twelve hours, when the glucoside is separated in fine needles. A more complete precipitation takes place when chloroform is used instead of ether; but the precipitate is amorphous.

Nearly as good results are obtained by mixing the powdered drug with milk of lime, drying the mixture, exhausting it with boiling alcohol, evaporating, treating the residue with ether and subsequently dissolving in alcohol.

The glucoside, for which the name of *villosin* is proposed, forms fine silky needles melting at 173–175° C. to a brown mass; heated on platinum foil it melts and burns with a sooty flame, leaving no residue. It is freely soluble in methyl, ethyl and amyl alcohols, sparingly soluble in water, slightly soluble in petroleum benzin, insoluble in chloroform and nearly so in ether. The taste is bitter, best perceptible in the alcoholic solution. The aqueous solution is not precipitated by lead acetate, but yields a precipitate with lead subacetate. Villosin does not reduce silver nitrate, even on heating. Ferrous and ferric salts cause no change. Alkalies color lemon yellow. Sulphuric acid colors light brown, changing to deep violet with little water. Sulphuric with a drop of nitric acid colors deep orange, then red, by heat destroyed. Froehde's reagent colors dark brown, and on heating, brown green; but Froehde's reagent with a drop of nitric acid gives a red color. An aqueous solution, containing in 5 cc. 0·030 gm. of the glucoside, yielded with Fehling's solution 0·020 gm. precipitate; on boiling the solution previously with dilute acid the precipitate weighed 0·024 gm.

For estimating the tannin 10 gm. of the bark were exhausted with 93 per cent. alcohol, the tincture evaporated, and the extract dissolved in water. Using Mueller's method 9·19 per cent. of tannin were found; by Guenther's method, 9·88 per cent., and by Lœwenthal's method 10·3 and 10·4 per cent. But working with cold infusions of the bark, the results were as follows: by Guenther's method 10·0 per cent., and by Lœwenthal's method 11·1, 12·5 and 11·8 per cent.

NOTE ON ADULTERATED SPANISH SAFFRON.

BY G. M. BERINGER, PH.G.

Read at the Pharmaceutical Meeting November 19.

Two lots of adulterated saffron have recently come under my notice. The first was of a handsome color, excellent in odor, and brought a very high price. It yielded on incineration 40 per cent. of ash. On close inspection it was found to be an admixture of vegetable fibre of unknown origin with a small quantity of genuine saffron.

The fibre was in pieces from ½ inch to 1½ inches long, and upon microscopic examination proved to be the stem of a monocotyledon, most likely a species of grass. This was loaded with a calcium sulphate artificially colored, and attached thereto with some saccharine substance, most likely glucose. A small quantity thrown on water soon deposited a heavy precipitate of the sulphate, tinting the water a pinkish yellow.

A portion was taken from the centre of the can, and of this 5 gms. was carefully weighed and then carefully picked over, separating the true saffron and the adulterant. The following statement exhibits the proportion of each :

·915	gms. genuine saffron.
3·745	gms. adulterant.
·240	gms. refuse so broken as to be impossible to separate.
·1	gm. loss in handling.
5·000	gms.

From these figures it would appear that the saffron contained only about 20 per cent. of genuine saffron.

The adulterant yielded 52·7 per cent. of ash, containing considerable calcium sulphide.

The coloring matter of the adulterant was found to yield an orange-yellow solution to alcohol, and when thus extracted and the solvent evaporated was obtained as an orange-red powder, which dyed silk a bright yellow and showed with reagents the following reactions: With concentrated sulphuric acid a violet-red, on diluting the color gradually fades. With concentrated hydrochloric acid a violet-red, on diluting destroyed. With sodium hydrate the color gradually fades. With ammonium hydrate the aqueous solution produces a bright yellow color. Stannous chloride and hydrochloric acid destroyed the color. Its aqueous solution is bleached by calcium hypochlorite and precipi-

tated as a pale yellow precipitate by lead acetate. These reactions point to the presence of some artificial non-vegetable coloring.

The true saffron in the mixture yielded 5·7 per cent. of ash, about the normal amount, and deposited no pulverulent substance on soaking in water.

A somewhat similar adulteration of saffron was reported by W. Brandes, *Pharm. Ztg.*, 1879, p. 506 (see AMER. JOUR OF PHAR., 1879, p. 558), who reported 50 per cent. of stems obtained from a plant belonging to the Gramineæ or Caricineæ, probably from Cavex capillaris, the stems being loaded with calcium carbonate previously colored with cochineal.

The second lot of saffron was genuine Spanish saffron, excellent in color and odor, contaminated with but a small quantity of the yellow styles and a few stamens, but loaded with sodium sulphate. It yielded 17 per cent. of fusible ash. The adulteration of saffron with soluble salts, such as the borate, carbonate and sulphate of sodium and ammonium salts, has been previously reported in France by M. Adrian (*Jour. de Pharmacie et de Chimie,* 1889, p. 98), and in England by E. M. Holmes (*Phar. Journ. aud Trans.*, February, 1889, p. 666).

GLEANINGS FROM THE GERMAN JOURNALS.

BY FRANK X. MOERK, PH. G.

Tannin is warmly recommended in cases of severe burns and scalds, it quickly relieving pain and causing rapid healing. It is applied in 5 per cent. solution by allowing the solution to trickle over the sore; this is repeated whenever the bandage is changed; a cooling ointment is applied after the tannin solution.—*Pharm. Ztg.*, 1889, 630. (See also AMER. JOUR. PHAR., 1886, p. 611.)

Sodium thiosulphate in commercial bicarbonate is occasionally found; the quantity being generally small, J. Lüttke uses the following method for its detection: A solution of the bicarbonate (1:30) is acidified with hydrochloric acid and a few cc. of a solution of barium nitrate added; in presence of *sulphate* a white turbidity is produced which must be removed by filtration after standing for some time. To the clear filtrate is now added a single drop of a solution of permanganate of potassium (1:1000) when if thiosulphate was present a white precipitate of barium sulphate is produced.—*Pharm. Ztg.*, 1889, 629.

Precipitated zinc sulphide has been used both internally and externally, with good results in chronic eczema and psoriasis. For internal use Barduzzi prescribes : Zinc sulphide 0·50, extract of gentian, sufficient to make 50 pills; from 3 to 12 pills are taken daily. Externally it is applied: Zinc sulphide 5·0, lanolin 20·0, lard 30·0.—(*D. M. Ztg.*) *Apoth. Ztg.*, 1889, 1184.

Annidalin, a patented substitute for iodoform, is an iodine derivative of thymol made by the action of iodine upon an akaline solution of thymol. It is of a red color and in the dry state retains its color for months, if kept in the dark; in the presence of moisture or on exposure to light, iodine is liberated. This preparation is one of a new class of phenol derivatives; the corresponding compound of phenol or carbolic acid has the formula $C_6H_3I_2.OI$ and is isomeric with the well-known *triodophenol* $C_6H_2I_3.OH$. This forms an odorless, violet-red preparation, insoluble in water and dilute acids, soluble in alcohol, ether, benzol and chloroform; it melts at 157°C., decomposing at the same temperature.—(*Ber. D. Chem. Ges.*) *Pharm. Centralhalle,* 1889, 637.

Oil of Cinnamon.—The adulteration of commercial oils with rosin (Am. Jour. Phar., 1889, 575) is confirmed by the work of Dr. H. Gilbert, who also advances a simple test for the detection of this adulterant and gives some data on the resinification of oils of cinnamon. The detection of non-volatile matter is effected by exposing one gram of the oil in a flat watch-crystal to 110°–120° C. in an air-bath until constant weight is obtained. Various cassia oils yielded from 5 to 30 per cent. residue, two oils (guaranteed pure) 6 and 11 per cent. and in genuine Ceylon oil 2 to 3 per cent. residue. To determine if exposure to light and air could cause such an increase of residue (20–30 per cent.) a steady current of air was passed through a sample of pure cassia oil (leaving 6 per cent. residue) and also one of pure Ceylon oil (with 2 per cent. residue) for *forty* hours; the experiments were conducted near a window so as to expose to as much sunlight as possible during the time. The residue from the cassia oil amounted to 6·5 per cent., from the Ceylon oil to 3·5 per cent.; while resinification could be detected under these favorable conditions, still it was so slight that exposure could not account for very high percentages of residue. A sample of pure cassia oil (specific gravity 1·060) after the addition of 20 per cent. rosin had the specific gravity 1·065. The crystals obtained by mixing the oil with nitric acid can not be considered as a reliable test, as adulterated oils will also give the crystals.

and a pure oil at times fails to produce them. The acidity of the oils gives important information as to the presence of rosin and is best determined by dissolving 2 gm. oil in 30 cc. alcohol, adding a few drops of phenolphthaleine and titrating with alcoholic potassium hydrate; the number of milligrams of KOH required to neutralize one gram oil gives the acidity figure.

Pure cassia oil (6 per cent. residue) 13; this was not changed by passing air through it for forty hours. Pure Ceylon oil (2 per cent. residue) 9; another sample (2·5 per cent. residue) 10. An adulterated sample of cassia oil (28 per cent. residue) 47; sample of cassia oil to which 20 per cent. rosin had been added, 40. Rosin has an acidity figure of 150. The figures just quoted render the method an important one.—*Chemiker Ztg.*, 1889, 1406.

Ricinin, the poisonous principle of castor oil seeds, is not, as has been claimed, an alkaloid, but is an albuminoid, one of the phytalbumoses and belongs to the class of unorganized ferments. Boiling its solutions almost immediately destroys its activity, while heated dry it is not easily decomposed. It can be prepared from the seeds (after removing the integuments and the oil) by percolating with a 10 per cent. salt solution. The percolate is saturated with sodium and magnesium sulphates and allowed to stand in the cold, when besides the double salt there forms a white precipitate, easily separated from the crystals, which is filtered off and transferred to a dialyzer. In the dialysis the temperature must be kept sufficiently low to prevent decomposition. The slimy mass is scraped from the septum and dried in vacuo over sulphuric acid; after drying the masses are very easily pulverized and yield an odorless white powder, still retaining from 10–20 per cent. ash which, however, does not interfere with its physiological action. The powder can be preserved for long periods; its best solvent is a 10 per cent. salt solution which for experiments can be diluted without formation of an immediate precipitate. The varities of Ricinus, Croton Tiglium and Jatropha Curcas all appear to contain poisonous albuminoids which are similar, if not identical. Attention is called to the danger arising from the accumulation of castor oil press-cakes which contain a substance more poisonons than arsenic (and for which no test is known) and which can so easily be obtained by any one; the suggestion is also made that the manufacturers of castor oil should be compelled to use the press-cakes as fuel as soon as they are taken out of the press or else to mix with water

and boil to destroy the activity of the poison.—Hermann Stillmark, Aus den Arbeiten des pharmakologischen Instituts zu Dorpat. *Pharm. Centralhalle,* 1889, 650.

The Examination of Castor Oil.—The specific gravity 0·950-0·970, the deposition of crystalline floccules at 0°C., the solubility in alcohol and glacial acetic acid, and the absence of a dark brown color if 3 parts castor oil be mixed with 3 parts carbon disulphide and 2 parts sulphuric acid, while sufficient to detect foreign vegetable oils, will not detect rosin oil owing to similar behavior towards the above reagents. Rosin oil may be detected by saponification and agitation of the aqueous soap solution with ether, separating and evaporating the ethereal solution when the rosin oil will be obtained. The behavior with nitric acid of sp. gr. 1·31 is also of value. Castor oil is colored only slightly brown, while the acid solution remains colorless; in the presence of rosin oil the oily layer will be decidedly dark colored (almost black) and the acid layer will be of a brownish color. A sample of castor oil examined contained about 19 per cent. rosin oil, and gave satisfactory results with the tests first mentioned.—Dr. H. Gilbert, *Chemiker Ztg.,* 1889,1428.

ABSTRACTS FROM THE FRENCH JOURNALS.

TRANSLATED FOR THE AMERICAN JOURNAL OF PHARMACY.

MERCURIAL FLANNELS.—Prof. Merget in a recent thesis supporting the belief that mercury cannot be absorbed by the healthy skin, and that mercury inunctions act only through the respiratory organs, which absorbed their vapor, proposed the use of mercurialized flannels to replace the inconvenient ointments now employed. M. Carles explains (*Gaz. des Sci. méd. de Bordeaux*) how these should be prepared. Thick, soft flannels should be first relieved of fatty matters by soaking for three hours in a 25 per cent. solution of bicarbonate of soda, after which they are lightly wrung out and plunged into clear water. After a second wringing, made gently—with the object of retaining a portion of the alkaline salt—they are placed for four or five hours in a saturated solution of nitrate of mercury. As strong vapors are thus disengaged, the process should be carried on under a chimney of some sort. The flannels should then be lightly soaked in a 1 to 2 solution of liquor ammoniæ and, when a grayish cast shall have been obtained upon them, should be dried in a shaded place in the open air. They are then beaten, to

remove the metallic particles, and put away in glass-stoppered bottles. In using, a square of 25 centimeters is placed upon the chest, or, at night, in a small, open bag upon the patient's pillow within the influence of the respiratory organs. These flannels give off mercurial vapors for years, but the dose gets too weak for therapeutic purposes in about three weeks, when they should be renewed. They are eligible for use against *pediculi pubis* and other skin parasites.—*Répert. de Phar.*, Oct.

COMPOSITION OF ABSINTHE.—As one result of physiological and chemical researches made on absinthe by M. M. Cadéac and Albin Meunier (*Acad. de Méd.*, Sept. 10), the constituents of absinthe, as ordinarily made, are given as follows: volatile oils of anis, 6 gm.; of illicium, 4 gm.; absinthium, 2 gm.; coriander, 2 gm.; fennel, 2 gm.; menthe, 1 gm.; hyssop, 1 gm.; angelica, 1 gm.; melissa, 1 gm.; alcohol, 70 per of cent.. colored with the fresh leaves of dead nettle [*ortie*] or parsley. The authors think that the poisonous properties of absinthe liquor are chiefly due to the oils of anis and of illicium; not that these are very toxic in the ordinary sense, but that they constitute a poison against the nervous centres, diminish muscular energy, paralyze the will, cause vertigo, trembling, stupor, etc., and, at times, epileptiform convulsions. The authors think that the wormwood contained in the liquor is nearly innocuous, and that the formula would be sufficiently amended by largely decreasing the amounts of illicium and anis contained in it.

DISINFECTANT DENTIFRICE.—Prota-Giurleo gives the following: Alcohol of 40 per cent. 500; camphor, 10; salicylic acid, 20; benzoin, 50; clove stalks, 100; hypochlorite of lime, 50; essence of anis, 20; glycerin, 500. All of the substances except the hypochlorite and anis are placed in a strong, closed flask which is subjected in a water bath to 60° C. of heat for five hours, agitating occasionally. After macerating for eight days and filtering, the hypochlorite is added, when a further maceration of eight days is given, when the anis is added and the preparation is finally filtered. The liquid should be put up in small blue or yellow phials. This preparation perfumes the mouth, whitens the teeth and frees the adherent tartar. It also hardens the gums and arrests gingival hemorrhages. For a mouthwash two teaspoonfuls are added to a quart of water.—*Farm. Ital.; Boll. Ital.; Répert. de Phar.*, Oct.

REACTIONS OF THE NAPHTHOLS.—The naphthols are very soluble

in alcohol, ether, chloroform and the alkalies, soluble in glycerin, and sparingly soluble (20 cgm. to 1,000 gm.) in water; alcoholized water dissolves them fairly well for practical purposes. M. Verhassel presents the following list of reactions abtained directly, without previous solution:

	Alpha naphthol.	Beta naphthol.
Chloride of lime liquor.	Violet coloration.	Yellowish green.
Ferrocyanide of potass.	"	Faint yellow.
Ferricyanide of potass.	Brown.	Greenish yellow.
Ammonia.	Colorless.	Greenish.

When the naphthols are dissolved in alcohol and water, perchloride of iron gives an abundant violet precipitate with alpha naphthol, which becomes white and then disappears. With beta naphthol it gives an emerald green color, and, with an excess of the reagent, a greenish precipitate.—*J. de Phar. d'Anvers,* Sept.

REACTION OF SACCHARIN.—The solution containing saccharin is evaporated in a porcelain dish, and the residuum treated with nitric acid. A fragment of caustic potash is added, and one or two drops of 50 per cent. alcohol; the mixture is then heated. If saccharin be present the mixture turns to a violet blue color and then to red. The presence of a half milligram of saccharin may thus be detected.—*Ann. di Chim. e di Farm. et Or.; Répert. de Ph.,* Oct.

LOCAL ANÆSTHESIA WITH SELTZER WATER.—Dr. Voituriez, (*J. de sci. méd. de Lille*) recommends the use of siphons of seltzer water for this purpose, the jet being held at about ten centimeters from the region to be anæsthelized. He uses at first two or three bottles of the seltzer, which gives anæsthesia for four or five minutes, when a small additional quantity will suffice to prolong the effect.

NATIVE WYOMING SOAP.

Contribution from the Chemical Laboratory of the Philadelphia College of Pharmacy.—No. 63.

BY HERMANN WESTPHAL, PH. G.

This mineral, which is known locally under the name of "Native Wyoming Soap," occurs in the Blue Ridge, 30 to 40 miles west and southwest of Sundance, Wyoming Territory, at an elevation of about 5,000 feet.

It is found in two distinct forms. 1. *The wet variety,* which occurs in sink holes, or in the neighborhood of springs, and covers, probably, an area of several hundred acres. It forms a thick very tenacious

pasty mass, about the consistency of butter. Its color is light yellowish gray. Taste slightly saline, clay-like. Odor argillaceous. Moistened between the fingers with a little water it feels like soap or some greasy substance: hence its name. This soapy feel is probably due to the extreme fineness of the silicates which it contains. In hot weather, the edges of the sink holes become hard and brittle, and on some places show an efflorescence of fine crystals of magnesium sulphate.

These holes, which seem to be almost bottomless, at times become very annoying to the ranchers, as cattle frequently get into them, and unless discovered in time and pulled out are sure to perish, as it is impossible for them to free themselves.

2 *The dry variety* occurs underground in veins like coal. It is hard and dry, and looks very much like chalk; the color is somewhat darker, varying from yellowish-white to dirty greenish-yellow. On addition of a little water, howerer, it is converted into the soft variety as found on the surface of the earth. It appears probable that the wet variety is formed by springs running over beds of the dry soap, washing it up and in time accumulating it in large quantities.

It is used by cowboys and ranchers who live in the vicinity as a substitute for soap, and for removing grease by absorption. They also use it for making "hard water."

Five grams of the soap, exposed to the atmosphere for several weeks, at a temperature of about 24°C. lost 41·20 per cent. of moisture. It had become a very hard and brittle mass varying from dirty white, grayish-green to orange-yellow. Taste and odor were unaltered; it adhered to the tongue, and when cut with a knife exhibited a very smooth and shining surface. On ignition the wet soap lost 53·30 per cent. while the air-dry lost 12·10 per cent. corresponding to 41·20 per cent. on exposure. The air-dry soap reduced to an impalpable powder gave the following composition on analysis:

SiO_2	61·08	per cent.
Fe_2O_3	3·71	"
Al_2O_3	17·12	"
MnO	traces	
CaO	2·96	"
MgO	1·82	"
Na_2O	0·20	"
SO_3	0.88	"
H_2O	12·10	"
Total	99·87	"

DIFFUSION OF ACIDS AND BASES INTO ONE ANOTHER.[1]

BY J. STEFAN.

When very dilute ammonia is placed over a column of dilute hydrochloric acid, the surface of separation between the acid and the alkaline liquids remains well defined, as can be easily observed if the solutions are colored with litmus, but the region occupied by the acid gradually extends upwards. In one experiment, a solution containing 1 gram-molecule of hydrochloric acid per litre was covered with a solution of ammonia containing one-sixteenth of a gram-molecule; the surface of separation rose 8·2, 16·5, and 24·5 mm. in one, four, and nine hours respectively, the rise being proportional to the square root of the time during which diffusion takes place. With the same hydrochloric acid, employing a solution of ammonia containing ¼ gram-mol., the surface of separation rose 5, 9·9, and 14·7 mm. in one, four, and nine hours respectively.

When a solution containing 1 gram-mol. of ammonia is employed, the region occupied by the acid extends upwards, rising 1·2, 2·3, and 3·5 mm. in one, four, and nine hours respectively, but when the ammonia is four times as concentrated, the surface of separation gradually sinks, and the depression is 1·2, 2·5, and 3·8mm. in one, four, and nine hours respectively. If ammonia of a certain concentration were employed, the surface of separation would remain stationary. The concentration of the ammonia which would fulfil this condition would lie somewhere between that of the solutions employed in the last two experiments; the exact strength cannot be ascertained experimentally except with great difficulty, but it can be shown mathematically that the surface of separation would remain stationary if solutions of 1 mol. of hydrochloric acid and 1·8 mol. of ammonia respectively were employed.

The phenomena described above are determined by the relative concentrations of the acid and alkaline solutions; they are independent of their absolute values, at any rate as long as the latter are not very large.

Similar experiments were made with solutions containing 2 gram-mols. of hydrochloric acid and 0·5 gram-mol. of ammonia respectively. The region occupied by the acid extended 5, 9·9, and 14·8 mm. upwards in one, four, and nine hours' time.

[1] *Monatsh.*, x, 201–219; reprinted from *Jour. Chem. Soc.*, 1889, p. 1046.

When the hydrochloric acid solution contains only $\frac{1}{16}$ gram-mol., and the ammonia 1 mol., the surface of separation falls 3·9, 8·2, and 11·9 mm. in one, four, and nine hours respectively; with solutions containing 1·5 gram-mol. of hydrochloric acid and 12 gram-mols. of ammonia respectively, the surface of separation falls 3·9, 8·4, and 11·6 mm. in the same times. In those experiments in which the region occupied by the ammoniacal liquid extends downwards, the two solutions do not remain so sharply separated, and the surface of separation is often irregular.

In one experiment with solutions containing 1 gram-mol. of soda and $\frac{1}{16}$ gram-mol. of acetic acid respectively, the region occupied by the alkaline liquid extended 5·8, 11·6, and 17·4 mm. upwards in one, four, and nine hours, and 28·5, 40·5, and 39·7 mm. in one, two, and three days respectively.

The apparatus employed in these experiments consists of two graduated glass tubes (120 mm. in length, 7 mm. in internal and 23 mm. external diameter), fixed, with their open ends turned towards each other, on a perpendicular brass stand, so that they can be moved up and down or rotated round the stand. The open ends have ground edges, the other extremities being closed with glass plates, fastened on with cement. The underneath tube is filled *in situ;* the other is filled, then inverted, and any liquid which falls out replaced with a small pipette. At the commencement of the experiment the open ends of the two tubes are brought to the same level, and they are then rotated until the one is exactly over the other.

The author discusses the phenomena of diffusion mathematically, and, from the data given above, the coefficient of diffusion of ammonia is found to be 0·92, and that of hydrochloric acid 3·02.

From observations made in a similar manner with ammonia and various acids, the diffusion coefficients are found to be as follows:—Nitric acid, 2·93; sulphuric acid, 1·82; oxalic acid, 1·14; and acetic acid, 0·88. In all the experiments, solutions containing one equivalent of the acid and $\frac{1}{16}$ of an equivalent of ammonia respectively were employed. In two experiments in which solutions of one equivalent of base and $\frac{1}{16}$ of an equivalent of acetic acid were employed, the diffusion coefficient of potash was found to be 0·73, and that of soda 1·57. The above values are for the temperature of 21°.

The diffusion coefficients of hydrochloric acid, nitric acid, and sulphuric acid are considerably larger than those found by Scheffer (*Zeit.*

physikal. Chem., ii, 390–404) by the ordinary methods, but the results are not comparable, as Scheffer experimented at lower temperatures; the coefficients found for the other substances agree better, and in some cases very well. The diffusion coefficients found for the three acids named above, and those of potash and soda, are in the same ratio as the molecular conductivities of these electrolytes as determined by Kohlrausch; but the coefficients of oxalic acid, acetic acid, and ammonia are larger than they should be if they followed the same rule. The diffusion coefficients, and those values which are termed the coefficients of chemical affinity, also stand in a direct relation to one another.

ON SOME SODIUM AND MANGANESE COMPOUNDS.[1]

MANUFACTURE OF SODIUM SULPHIDE.

Sodium sulphide is generally made either by double decomposition or by reduction of sodium sulphate. The former process was described by W. Weldon. Another process of double decomposition is that of barium sulphide and sodium sulphate, but this process is only practicable where there is a ready sale for barium sulphate as "blanc fixe." As regards the reduction of sodium sulphate, this article is ground to a coarse powder, mixed with coal-dust in the proportion of 3 to 2, and the mixture heated in a reverbatory furnace. The furnace is 6 meters long, 2 meters wide, 1·7 meters high, and well lined with fire-brick. The bed is divided into two portions, that next to the fire-bridge for the reduction, and the other for the preliminary heating of the charge, which may consist of 150 kilos. of sodium sulphate and 100 kilos. of coal. About 1¾ hours are required for the reduction of this charge. At the end of the operation the fluxed mass is run into iron boxes which are well closed, in order to prevent oxidation. Perhaps a revolving furnace may yet be employed for the reduction, although a few experiments in this direction gave unsatisfactory results. The mass obtained from the furnace weighs about 110 to 115 kilos., and contains up to 60 per cent. of sodium sulphide. Its appearance should be red and porous, but not gray and dense. The cooled mass is broken up into large balls, and thrown into lixiviating vats, arranged and fitted on the same principle as black-ash vats. The lixiviation is performed with warm water, and the liquor running from the strongest vat stands at 32° B. It is allowed to

[1] *Jour. Soc. Chem. Ind.; Oil, Paint and Drug Reporter.*

settle for an hour or so, and afterwards run into shallow iron crystallizing pans, where, after four or five days, a copious crop of yellow or brown crystals is formed having the formula Na_2S+9H_2O. The mother-liquor is siphoned off and again boiled down to 31°B. for further crystallization. The large crystals formed are broken up, allowed to drain, and ultimately jigged in a centrifugal machine, whereby they obtain a lighter appearance. Dark crystals are washed with light concentrated liquor, which improves their appearance. The salts obtained during the concentration of the liquors, owing to their oxidation, are employed in the furnace in the place of sodium sulphate.

MANUFACTURE OF SODIUM NITRITE.

Sodium nitrite is one of the most important chemicals used in the manufacture of azo dyes. There exist several methods for its manufacture, all of which are based on the reduction of sodium nitrate by means of lead. For this purpose the latter is fused and poured on iron plates in thin layers. After cooling, the lead plates are rolled up, and weighed out in parcels for use. The lead should be free from zinc and antimony. The sodium nitrate is then fused in shallow cast-iron pans fitted with a mechanical agitator, and when the mass is thoroughly fused, two and a half parts of lead are added at short intervals for each part of sodium nitrate (95–96 per cent. $NaNO_3$). The reduction ensues immediately. The thin leaves of lead fuse easily, and are oxidized to yellow lead oxide (litharge). After some time a further amount of lead is added, as an excess of lead is necessary, and the agitation of the fused mass is continued for at least three-quarters of an hour, in order to obtain a product of high strength. The mass has a tendency to stick to the sides, and great care must be exercised to remove these crusts with an iron spatula, as the slightest inattention causes the burning through of the pan. If the crusts turn reddish, it is a certain sign that the pan is in great danger of being destroyed. These crusts must at once be covered by a fresh quantity of nitrate, and the fire withdrawn if necessary. The whole process of fusion is finished in about 3½ hours. A sample drawn should test at least 90 per cent. of sodium nitrite. The mass after cooling is lixiviated in wrought-iron tanks with water or weak liquor. As soon as the solution stands at 36° to 38° B. it is siphoned off and neutralized with nitric acid of 1·029 specific gravity. The liquor is then concentrated to 42° or 43° B., allowed to clarify for

three or four hours, and ultimately run into lead-lined wooden tanks. Crystals of a light yellow color quickly make their appearance, which are deprived of their adherent moisture in the customary manner. The mother liquor, in conjunction with other liquors, is again boiled down to crystallization. In this way crystals are obtained of the following percentage :—

	$NaNO_2$ Per cent.
1st crystallization	95·5 to 95·5
2d crystallization	94·8 to 95·5
3d crystallization	94·2 to 94·5
4th crystallization	94·0 to 94·2

By drying at 60° C. their percentage is increased to 96 per cent. If a purer product be required, it must be recrystallized. Some difficulty is experienced in working up the mother liquors. If crystals of only 94 per cent. of $NaNO_2$, or below that strength, be obtained, the mother liquors must be concentrated by themselves in pan No. 2. Here crystals containing 86 to 92 per cent. of $NaNO_2$ are produced, which are employed for enriching the strength of fresh liquors. If the crystals from pan No. 2 sink below 80 per cent. their mother liquors must be concentrated separately in pan No. 3, whereby crystals containing 50 to 75 per cent. of $NaNO_2$ are obtained. These serve for enriching the liquors in pan No. 2. Weaker crystals are returned to the melting pot and treated with lead. Nevertheless, it is sometimes difficult to avoid the formation of salts, which require a special treatment in every case.

The lead oxide, obtained as a by-product, is washed, and afterwards converted into the different lead preparations of commerce, or reduced to metallic lead, when it returns to the process.

ACTION OF AIR ON MANGANESE CARBONATE.

At the ordinary temperature carbonate of manganese, whether native, precipitated, or crystallized from solution in carbonic acid water, is oxidized with difficulty whether exposed to air or to aerated water. In the most favorable case—the precipitated carbonate kept for ten years in aerated water—the proportion of oxygen combined was only that required to form MnO_2MnO. The same compound, produced by directly combining an equivalent of hydrated manganese dioxide with one of hydrated manganese monoxide, does not absorb any additional oxygen, even after five months' exposure to air or water. Manganite, MnO_2MnO, is then the limit of oxidation at the

ordinary temperature. At 100°, however, and still more at 200°, the carbonate, the protoxide and the sesquioxide readily undergo oxidation beyond this point, and may be perhaps completely converted into dioxide. The author concludes, in the absence of any analyses showing the native dioxide of manganese to have been produced from the carbonate, that such has not been the case.

FORMATION OF HYDROGEN PEROXIDE FROM PERSULPHURIC ACID.[1]

By M. Traube.

To determine whether oxalic acid is oxidized by persulphuric acid (SO_4) in 70 per cent. sulphuric acid solution as stated by Richarz (*Ber.* xxi, 1670), the author added a known quantity of oxalic acid, dissolved in 70 per cent. sulphuric acid, to 70 per cent. sulphuric acid containing a known quantity of persulphuric acid, and passed a stream of air, free from carbonic anhydride, through the mixture for three hours; not a trace of carbonic anhydride was evolved. The mixture was then made up to 100 cc. with 70 per cent. sulphuric acid, and (1) the quantity of oxalic acid, (2) the total available oxygen, (3) the available oxygen in the hydrogen peroxide, and (4) the available oxygen in the persulphuric acid determined. The results showed that oxalic acid is not acted on by persulphuric acid in presence of 70 per cent. sulphuric acid, and that, in the first two or three hours, more than two-thirds of the persulphuric acid is decomposed, and its available oxygen almost completely converted into hydrogen peroxide. When the experiments described above occupied more than two or three hours carbonic anhydride was evolved, owing to the oxidation of the oxalic acid by the hydrogen peroxide; at low temperatures (8–10°), however, the evolution of carbonic oxide was very slight.

It was proved by similar experiments that carbonic oxide is not oxidized by a 70 per cent. sulphuric acid solution of persulphuric acid, and that within 3½ hours, more than two-thirds of the available oxygen is converted into hydrogen peroxide. As, therefore, persulphuric acid is such a feeble oxidizing agent, it cannot be true that it oxidizes water, as is stated by Richarz (*loc. cit.*).

When a 40 per cent. sulphuric acid solution (20 cc.) of persulphuric acid (= 16 milligrams of the available oxygen), free from hydrogen peroxide, is diluted with water, neutralized with barium carbonate, and

[1] *Berichte*, xxii, 1518–1528; reprinted from *Jour. Chem. Society*, 1889, p. 940.

filtered, the filtrate contains hydrogen peroxide (= 7·4 milligrams of available oxygen); this experiment shows that Richarz's view (*loc. cit.*) that hydrogen peroxide is only formed from persulphuric acid in 70 per cent. sulphuric acid solution, is untenable.

Violet chromic sulphate is not oxidized to chromic acid by a 40 per cent. sulphuric acid solution of persulphuric acid; when chromic acid is treated with persulphuric acid in 70 per cent. sulphuric acid solution, it is reduced to chromic oxide in consequence of the formation of hydrogen peroxide.

Persulphuric acid also differs from other powerful oxidizing agents in this. that in 70 per cent. sulphuric acid solution it does not decompose, but actually gives rise to hydrogen peroxide. Quantitative experiments showed that when hydrogen peroxide and persulphuric acid are present together in 40 per cent. sulphuric acid solution, they are both very slowly decomposed, equal molecules of the two compounds being destroyed, but a similar solution of either compound alone undergoes no considerable change within 48 hours.

Persulphuric acid does not act on organic compounds, or has, at the most, only a very slight action. In 40 per cent. sulphuric acid solution, it does not decolorize indigosulphonic acid until after half an hour's time, and a solution in dilute sulphuric acid (about 10 per cent.) can be filtered through paper without any reduction taking place. Neutral solutions of persulphuric acid are only very slowly reduced by alcohol, but arsenious acid is completely oxidized within a short time. Berthelot (1878,) has stated that arsenious acid is not acted on by persulphuric acid.

The following reactions show that persulphuric acid belongs to the class of oxygen molecule compounds (holoxides). Platinum, either in the form of wire or as platinum black, decomposes persulphuric acid with evolution of oxygen, but only in the presence of acid. A neutral or slightly acid solution of persulphuric acid oxidizes indigosulphonic acid only slowly, but immediately on adding ferrous sulphate. Persulphuric acid and hydrogen peroxide, when present together, behave like two holoxides. Persulphuric acid sometimes behaves as a reducing agent; a solution of 40 per cent. sulphuric acid, free from hydrogen peroxide, reduces lead peroxide, the hydrate of manganese dioxide, and silver peroxide.

The article concludes with a discussion of the existence of oxygen-molecule compounds, which is principally controversial.

A CONTRIBUTION TO THE DIETETICS OF ALCOHOL.[1]

By Dr. Alexei M. Mohilansky.

In order to study the action produced by an occasional (dietetic) use of alcohol on the nitrogenous metabolism and the assimilation of proteids and fats, Dr. Mohilansky, house physician to Professor V. A. Manasseïn's clinic, has undertaken careful experiments on 15 healthy men (mostly medical students), aged from 18 to 28. Some of the subjects were total abstainers; some were occasional, and others habitual alcohol drinkers. The administration of alcohol varied according to the subject's habit, the daily dose oscillating between 60 and 140 ccm. of absolute alcohol, or from four small wineglassfuls (rïumka) to half-a-bottle of a 40 or 42 per cent. vodka (aquavit). To put it otherwise, the beverage was given in a dose sufficient to produce a slight intoxication (high spirits and talkativeness, etc.). The principal results of Dr. Mohilansky's important and very instructive researches may be given somewhat as follows:—

(1) In habituated people, alcohol, when taken in moderate quantities, distinctly improves appetite and gives rise to a marked increase in the assimilation of the nitrogenous constituents of food, the average surplus amounting to 2·09 per cent., the maximal to 4·22 [*e. g.*, a patient who had been assimilating 93·10 per cent. of nitrogen, without alcohol, proved to be assimilating 96·07 per cent. when alcohol was added to his dietary].

(2) In habitual total abstainers, however, the assimilation somewhat sinks (0·28 or 0·33 per cent.).

(3) The increased assimilation in the former category must be attributed to a more complete absorption and intensified gastric digestion, which result from a prolonged retention of food in the stomach, on one side, and from increased digestive power and secretion of the gastric juice (Claude Bernard, Kretschy, Richet, Lever, Petit et Sémerie, Glucinski).

(4) The nitrogenous metabolism, or disintegration of systemic proteids, almost invariably (in 13 out of 15 cases) decreases, the average fall being 8·73 per cent., the maximal 19·42, the minimal 0·14 [*e. g.*, in a patient in whom the metamorphosis in non-alcoholic days had amounted to 80·11 per cent., in alcoholic ones it fell to 63·78]. The decrease is observed very frequently even when small doses are taken;

[1] Condensed from a St. Petersburg Inaugural Dissertation, 1889, by Valerius Idelson; reprinted from *The Medical Chronicle*, November, 1889.

it is invariable in the case of moderate or middle-sized ones. However, there does not exist any strict parallelism between the dose and the amount of the inhibition of the metabolism.

(5) The decrease remains still perceptible for some while, even after discontinuing alcohol.

(6) It is probably dependent mainly upon alcohol inhibiting the systemic oxidation processes (V. A. Manasseïn, Schmiedeberg, Boecker), and further, upon its deviating the blood pressure, dilating blood-vessels, retarding the circulation, and depressing the bodily temperature.

(7) Alcohol also diminishes somewhat the assimilation of fats (to judge from the fact that the amount of fatty acids eliminated with fæces is augmented).

(8) It does not possess any diuretic action; on the contrary, it rather tends to inhibit the elimination of water by the kidney, which after all, should be expected beforehand, since alcohol dilates cutaneous blood-vessels and depresses the arterial tension, that is, favors cutaneous perspiration, and interferes with the renal action. [As a matter of fact, in two patients, the daily amount of the urine remained unaltered; in five, it increased on an average 7 per cent., while in eight it fell 12 per cent.].

(9) Such organs as are not habituated to the use of alcohol show a much stronger reaction towards the substance than habituated ones.

THE RESIN OF MYOPORUM PLATYCARPUM.

By J. H. Maiden, F.L.S., Curator of the Technological Museum, Sydney.

A veritable natural sealing-wax is yielded by a small tree which is found in the interior of Australia; it occurs in the more arid portions of all the colonies except Queensland. The tree is *Myoporum platycarpum*, R. Br., and it possesses a variety of local names, such as "Sandalwood," "Dogwood," and "Sugar tree;" the latter because a manna exudes from it which is greedily sought after by the blacks, and is likewise much appreciated by colonists. It yields a resin, which is used by the aboriginals as a substitute for pitch and wax; for example, they use it either alone, or mixed with fat, to cement the stone heads of their tomahawks to the fibre which joins them to the stick forming the handle. As has been already hinted, it forms a natural sealing-wax, and is sometimes used by people in

the interior for this purpose. It would probably serve as a constituent of black sealing-wax; alone it is too soft for keeping in this climate.

It sometimes occurs in great quantities on the stem, is hard and brittle, breaks with a glassy fracture which is at first of a purple or indigo color, but becomes brown on keeping. Often it may be picked up from under the trees in rounded or globular pieces.

Two samples have come into the writer's hands, and a few notes concerning them will doubtless be interesting. The first, from the Lachlan River, New South Wales, is in small rounded lumps usually weathered on the outside, and having a pleasant empyreumatic odor; these are of a dark reddish-brown color, fly with the slightest touch of the pestle, and are easily powdered. The resin has a bright fracture, which appears almost black, but shows reddish-brown at the edges. It softens even with the warmth of the hand, and if kept in a bottle, the heat of an average summer day is sufficient to fuse pieces presenting fresh fractures.

It presents some external resemblance to guaiacum resin (especially when that substance comes to market in small lumps), but it is not so green in color as the latter. It has no taste. Cold water has no effect on it, but if the water be heated the resin melts and floats, forming a liquid much resembling tar, but of a purplish-brown color. The water remains clear, colorless and almost odorless.

Light petroleum dissolves 46·8 per cent. of a reddish-brown resin, destitute of odor. Alcohol dissolves from the residue 28·1 per cent. of a deep reddish-brown resin, which is almost black by reflected light.

The residue was boiled in water and 1·7 per cent. of saline matter was extracted, while 23·4 per cent. of accidental impurity was left behind. This is of a chocolate color, and under a lens was seen to consist of a little ligneous matter, with a large percentage of inorganic impurity. It was quite free from gum.

Summary.

α-Resin soluble in light petroleum	46·8
β- " " alcohol	28·1
Saline matters	1·7
Accidental impurity	23·4
	100·0

The crude resin melts at 90·5°. It contains no tannic acid.

The second sample was procured from Netallie, Wilcannia, New South Wales. It presents no marked points of difference, as regards physical appearance, from the preceding one. On treating it with alcohol, the liquid is not so dark as that yielded by the preceding sample, neither is the color so rich. It resembles tawny port, but is a little darker.

Light petroleum extracts 48·6 per cent. of resin, and alcohol added to the residue extracts 36·4 per cent.—*Journal Chem. Soc.*, 1889, p. 665.

THE TOXIC ACTION OF THE ALBUMOSE FROM THE SEEDS OF ABRUS PRECATORIUS.[1]

By Dr. Sidney Martin.

In a previous communication (see American Journal of Pharmacy, 1887, page 503) the author demonstrated the presence of two proteids in the seeds of the *Abrus precatorius* or jequirity plant —a globulin and an albumose—and also discussed the physiological action of the globulin. The present paper deals with the physiological action of the albumose. The symptoms produced by injecting hypodermically the albumose are increasing weakness, with rapid breathing, without convulsions or paralysis. The post-mortem appearances are local œdema or ecchymosis, and gastro-enteritis with occasionally petechiæ on the serous membranes; the blood usually dark and fluid. When applied directly to the eye the albumose causes severe conjunctivitis and chemosis.

The poisonous action of the albumose is completely destroyed by boiling the solution. Up to 50° C. no effect is produced; at 70° to 75° C. the albumose is still poisonous, but not nearly to so great a degree as previous to heating; at 80° C. a still further diminution in activity is produced. The action of the albumose in producing conjunctivitis is also diminished by heat. It will be seen that there is a great resemblance in chemical composition between the abrus-poison and the toxic principle of snake-venom. Weir Mitchell and Reichert describe the venom of the rattlesnake as consisting of a globulin and a peptone. The latter, however, is not a true peptone, and is probably closely allied to the albumose class of proteids. If the venom of

[1] *Proc. Royal Society*, vol. xlvi; reprinted from *The Medical Chronicle*, November, 1889.

snake poison is heated, its activity is diminished and in some cases destroyed, the globulin being coagulated and the peptone-like body decomposed.

The results obtained may be thus summarized: The toxic principle of the jequirity resides in two proteids present in the seeds—a para-globulin and an albumose, which practically possess the same toxic properties. The activity of both these proteids is destroyed by moist heat. The snake-venom resembles abrus-poison in chemical composition, in its power of producing local lesions, of reducing body temperature and rendering the blood fluid after death, and to some extent in the effect on it of moist heat. Abrus-poison, however, is much less active than snake-venom. The fatal dose of snake-venom varies according to the species of snake from 0·0021 gm. to 0·000079 gm. per kilo. of body weight, whilst abrus-poison stands at globulin 0·01 gm., albumose 0·06 gm. per kilo. of bodily weight.

BOTANY BAY OR EUCALYPTUS KINO.

BY J. H. MAIDEN, F. L. S., F. C. S., ETC., Curator of the Technological Museum of New South Wales, Sydney.

The first part of the author's interesting paper, published in *Phar. Jour. and Trans.*, September 21, states that in Australia, kinos are largely used in rural medicine, on account of their astringent properties, aqueous solutions being almost invariably made. Some of them are used by the settlers for ink, or for staining leather black, the process simply consisting in boiling the kino in an iron saucepan. The commerce with Europe and America in eucalyptus kino has never been important. A good kino of uniform composition, offered by Mr. Bosisto, is collected from *E. rostrata*.

Wounding the bark stimulates the flow of kino in some cases, but such a practice does not appear to be systematically resorted to. Usually it is collected from the outside, which accounts for its occasional admixture with particles of bark, but sometimes it is contained between the concentric layers of the wood (chiefly in the case of *E. corymbosa*). In the latter case it has communication with the outside of the tree, though frequently the passage is blocked with indurated kino, which has to be removed to enable the store inside to be drawn off.

The eucalypts are popularly known in Australia as "gum trees," but certain species from the structure of their bark are called "iron barks" and "stringybarks." The "gums" are locally distinguished

as red, white, blue and by other adjectives. The adjective is in one district employed to describe the leaves, in another the bark, and so on. Thus a "white gum" may be intended to denote a tree with white leaves, white bark, etc. The variations in some trees in different localities, due to climate, soil and similar causes, are sufficient to render terms like "white gum," etc., which may in some way describe a species in one district, totally inapplicable in another.

Classification of Eucalyptus Kinos.—Eucalyptus kinos can be very simply classified according to their behavior with alcohol or water. In all cases the writer made the tinctures of the strength of tinct. kino, B. P. The kinos experimented upon by the writer fall into three groups, which he has called, the Ruby group, the Gummy group, and the Turpid group respectively.

a. Ruby Group:—

E. amygdalina, Labill.	*E. piperita*, Sm.
E. eugenioides, Sieb.	*E. Sieberiana*, F. v. M. (syn. *E. virgata*, Sieb.).
E. hæmastoma, Sm.	*E. stellulata*, Sieb.
E. macrorrhyncha, F. v. M.	*E. melliodora*, A. Cunn.
E. pilularis, Sm.	*E. obliqua*, L'Her.

In the preparation of a tincture all the above kinos tend to dissolve entirely, forming clear ruby solutions of approximately the same tint. They also form clear ruby solutions to cold water, hardly differing in appearance from the tinctures. The aqueous solution of the alcoholic extract is similar in appearance. Members of this group are not very friable, breaking down into clean angular fragments, and never forming an impalpable powder. If acetate of lead or of copper be added to a moderately strong solution of these kinos, so strongly gelatinous a precipitate will be formed that the test-tube may be inverted without any liquid spilling. This distinguishes them, in one respect, from the Turbid Group.

At present I know of no constant characteristics to aid in further sub-dividing this group. The stringy barks (*E. obliqua, macrorrhyncha*, etc.) may often be distinguished (as a group) by means of fibrous bark either attaching to individual fragments of kino, or loose with a parcel of it, but it must be borne in mind that many other species (*e. g., piperita*) have more or less stringy bark.

b. Gummy Group:—

E. leucoxylon, F. v. M.	*E. resinifera*, Sm.	*E. saligna*, Sm.
E. paniculata, Sm.	*E. robusta*, Sm.	*E. siderophloia*, Benth.

In spirit, these kinos scarcely dissolve, leaving abundant granular residue of gum. Supernatant liquid perfectly clear. These kinos tend to be perfectly soluble in cold water, and age seems to have but little effect on them in this respect. They are like the Ruby kinos in not forming impalpable powders, being even tougher than the members of that group. They form gelatinous precipitates with some metallic acetates, like the Ruby group.

c. Turbid Group:—

E. goniocalyx, F. v. M.
E. hemiphloia, F. v. M.
E. rostrata, Schl.
E. punctata, DC.
E. odorata, Behr.
E. Gunnii, Hook.
E. Stuartiana, F. v. M.
E. viminalis, Labill.
E. terminalis, F. v. M.
Angophora lanceolata, Cav.
A. intermedia, DC.

The above yield orange-brown solutions.

E. corymbosa, Sm., yields solutions up to the brightest ruby.

E. microcorys, F. v. M., and *E. maculata*, Hook., yield solutions of various shades, from lemon-yellow to orange-brown.

All the members of this group yield turbid solutions to spirit, which require long standing or filtering to become clear. They behave in a similar manner to water, but become clear on boiling, indicating catechin. The aqueous solutions of the alcoholic extract are likewise turbid. They are all more or less friable, forming impalpable powders usually by pressure of the fingers. Addition of acetate of lead or copper produces only a very slight gelatinous precipitate, thus dividing them from the other two groups.

Sub-division of the Group.—E. corymbosa kino is usually so brilliant in color, and yields such rich-colored tinctures that it cannot well be mistaken for any other kino.

E. microcorys and *E. maculata* are often externally much alike, but they may be distinguished (1) by the facility with which the former dissolves in water, (2) by the yellow color which the latter yields to ether.

E. maculata, E. punctata and *A. lanceolata* possess odors. The essential oils which cause them may be removed by ether.

Definition of the terms "Botany Bay Kino" or "Australian Kino." Not the product of E. resinifera.—I propose to investigate the claim of certain species to be yielders of the kino which for over one hundred years has passed under one or other of the above names. The first published allusion to this kino will be found at p. 233, *Journal of a*

Voyage to New South Wales, by John White, Esq., Surgeon-General to the Settlement, London, 1790. A plant is figured (flower-buds and bark), described by Dr. (afterwards Sir) James Smith, who wrote the botanical portion of White's book, as a new species, *Eucalyptus resinifera*, and the kino is thus alluded to:—"On making incisions in the trunk of this tree, large quantities of red resinous juice are obtained, sometimes even more than 60 gallons from a single tree. When this juice is dried, it becomes a very powerfully astringent gum-resin, of a red color, much resembling that known in the shops by the name of kino, and for all medical purposes fully as efficacious. Mr. White administered it to a great number of patients in the dysentery which prevailed much soon after the landing of the convicts, and in no single instance found it to fail. This gum resin dissolves almost entirely in spirit of wine, to which it gives a blood-red tincture. Water dissolves about one-sixth part only, and the watery solution is of a bright red. Both these solutions are powerfully astringent." What particular tree is indicated in the above passage will probably never be known. The sample of bark figured is smooth and scribbly, like that of *E. hæmastoma* perhaps, and certainly as unlike that of the two trees named by Sir James Smith and Allan Cunningham, *E. resinifera*[1] (*vide infra*), as it is possible for it to be. Only two trees in the Sydney district yield kino in anything like the abundance it was alleged to have been yielded by the *E. resinifera* of Smith. They are *E. corymbosa* and *Angophora intermedia*, but although I am well acquainted with these trees, and have made the matter of exudations of our native trees my special observation for over three years, the highest reliable estimate of the quantity yielded by either of them would not be more than one-third of the quantity mentioned by White. The red color would, however, exclude the *Angophora*, while *E. corymbosa* yields a "blood-red tincture" to spirit of wine, and dissolves almost entirely in that liquid, but such a kino would be readily and almost entirely soluble in cold water. Smith's description also contains the statement: "The wood is extremely brittle, and from the large quantity of resinous gum it contains is of little use but for firewood." Not too much stress should be laid upon an expression of opinion of the value of a timber made only a few months after the settlement of this continent, but the description of the wood being full

[1] *E. punctata* (included in *E. resinifera*) has a smoothish bark, but is not scribbly.

of gum-resins almost certainly applies to *E. corymbosa,* or to an *Angophora.* But the flower-buds figured are of a eucalypt (and that excludes *Angophora*), while they are as unlike those of *E. corymbosa* as possible. The bark figured is smooth, the flower-buds have something the shape of those of *E. punctata* (included by Bentham under Smith's *resinifera*), while the strongly-compressed peduncle, all taken in conjunction with the smooth bark (*E. resinifera* bark is never smooth, except occasionally on the branches), may show that Smith's figures refer to *E. punctata.* But the kino of *E. punctata* is liver colored or reddish-brown, and that description does not tally with that of White. All this tends to prove the truth of my original assertion, that the origin of the figures in White's book will probably never be known. As likely as not the bark and the flower-buds (no other parts being figured) were from different species.

It will be seen later on that the name *resinifera* was a singularly unfortunate one to apply to any species of eucalyptus, firstly, because they are nearly free from resin, and secondly, because scores of species yield this exudation (called "gum resin" by Smith) very freely. All kinos yielded by eucalypts, if they have been exuded sufficiently long, will be found, at a certain stage, to be only soluble in water to the extent of one-sixth, but aeucalyptus kino almost entirely soluble in spirit, and at the same time only one-sixth in water, is an impossibility.

White's description (for although penned by Smith, the substance of it must have been supplied by White) has partly been copied by many subsequent authors. A few extracts will suffice.

"*E. resinifera,* the brown gum tree of New Holland, furnishes Botany Bay kino. A single tree will yield 60 gallons." Balfour, "Manual of Botany." *E. robusta* is the only eucalypt ever known as "brown gum," but that species neither exudes kino freely, nor is the product readily soluble in spirit.

"*Botany Bay Kino.*—The substance called by this name is the produce of *Eucalyptus resinifera* (Myrtaceæ), and other species of eucalyptus, natives of Australia and Tasmania. It appears to be a kind of extract, and has properties similar to the official kino." (Pereira, "Materia Medica"). The surmise as to its being an extract has already been dealt with.

"*E. resinifera,* the Ironbark tree, a native of Australia and Van Diemen's Land, and several other species, yield an astringent substance called eucalyptus, or Botany Bay kino. The kino resembles in

its properties the official catechu and kino, and may be used for a similar purpose." (Bentley, "Manual of Botany"). The Ironbark tree above alluded to is the *E. resinifera* of A. Cunn. (*E. siderophloia*, Benth.), but neither it nor the *E. resinifera* of Smith extends to Tasmania.

As has already been mentioned, there are two eucalypts called *E. resinifera*. They are :—

1. *E. resinifera*, Smith (White's "Voyages," p. 233; "B. Fl.," iii, 245; figured in Decade I. of Mueller's "Eucalyptographia"). It is commonly called "Red or Forest Mahogany," and is the tree to which the species-name attaches by priority.

2. *E. resinifera*, A. Cunn. (Syn., *E. siderophloia*, Benth.); "B. Fl.," iii, 220. Figured in Dec. IV. of Mueller's "Eucalyptographia."

"*Ironbark*" *or* "*Red Ironbark*."—At the latter place Baron Mueller states, "The Rev. Dr. Woolls observes that the Botany Bay kino is more extensively obtained from *E. siderophloia* than from *E. resinifera* (Smith, of course), which, as the specific name implies, is generally regarded as the main or even sole source of that drug." And Dr. Woolls, in his "Plants of New South Wales," (1885), states, "The Botany Bay kino was procured principally from this species, and hence Allan Cunningham and other botanists were accustomed to call it *E. resinifera*."

But what are the characteristics of kino? The official kino (*Pterocarpus Marsupium*) is, according to the British Pharmacopœia of 1885, "almost entirely soluble in rectified spirit." This is an important property, and on it the tinct. kino B. P. is based. Works on materia medica, while pointing out certain unimportant points of dissimilarity between the official and eucalyptus kino, never state that the latter does not dissolve in rectified spirit, while some make the specific statement that it is soluble in that liquid. But my experiments have shown that no kino is more insoluble in spirit than that of *E. siderophloia*. I obtained four samples from widely different localities in New South Wales and Queensland, and collected at different times. They all agree in their very partial solubility in alcohol, by reason of the very high percentage of gum they contain. The *E. resinifera* of Smith is also comparatively little soluble in spirit, for a similar reason. For this reason alone, I do not hesitate to say that "Botany Bay kino" is neither the produce of *E. resinifera*, Smith, nor *E. resinifera* A. Cunn. Both these kinos would be quite

useless for the preparation of a tincture, and would never be thought of a second time by any person who had made the experiment on either; it is therefore quite certain that these species have not caused pharmacists to use eucalyptus kino more or less for a century, but rather, it has doubtless been the admixture of such kinos as these with such eucalyptus kinos as are freely soluble in spirit, which has helped to bring eucalyptus kino into disrepute.

I now give a list of species which satisfy the requirements of the B. P., and it is hoped that systematic endeavors will be made to place kinos, which do, or should come into that list on the market. Eucalyptus kino was official in the Edinburgh Dispensatory of 1811, but the different substances supplied under the same name doubtless led to its omission.

1. All members of the Ruby group.
2. The following members of the Turbid group:

E. goniocalyx, E. hemiphloia, E. rostrata, E punctata, E. odorata, E. Gunnii, E. Stuartiana, E. viminalis, E. terminalis, E. *corymbosa.*

The remaining members of the turbid group in my list must be for the present omitted, on account of their color; perhaps *E. punctata* would have to be rejected only on that account.

All members of the gummy group must be rejected.

Important Note.—The above list only contains those species which I have proved by experiment to be suitable. I can therefore guarantee them, and will only add others to the list as opportunities occur for testing them by other chemists or myself.

I suppose it is too much to expect that the specific name of *resinifera* shall be abandoned for any eucalypt. I know it is against botanical rules; but if the specific name *virgata* could be suppressed on account of the stature of a eucalypt, I think, on the ground of expediency, Baron Mueller may well suppress Smith's *E. resinifera,*[1] for this name has impeded attempts to obtain a knowledge of our kinos for a century. I have already specifically referred to two objections to the use of *E. resinifera* for Smith's species, and would now emphasize that it is a poor yielder of a poor kino. Out of nearly one hundred and fifty species of eucalyptus, most of them (perhaps all) yield it more or less, and of those which yield it most abundantly it is difficult to say which produces it the most freely, and to which

[1] Another eucalyptus is usually called by a false name, the essential oils being generally labelled *E. Globulus.*

the term "resinifera" would by right belong. Probably to *E. corymbosa*. But the name should be suppressed.

Gelatinization of Tincture of Kino.—The gelatinization of tincture of kino, by which it forms a substance like red-currant jelly, and more or less devoid of astringency, remains an unsettled question, although it has often been alluded to in journals devoted to pharmacy[1] during the last half century. Pereira following Thomson, and most other writers on materia medica following Pereira, state that where gelatinization takes place, "Botany Bay Kino" has been used, by which is meant, as I have already shown, any of the kinos belonging to perhaps 40 or 50 species.

I have had over seventy eucalyptus and angophora kinos in spirit (to make tinctures of B. P. strength), for periods varying from a few days to twelve months, and have drawn the following conclusions:—(1) Tinctures do not gelatinize if made from new kinos. By the word "new" I mean under one or two years old. (2) No kinos gelatinize other than the clear ruby ones. Five very old ruby kinos on which I experimented gelatinized in a month or two, (3) All kinos entirely soluble in spirit are ruby ones.

Whatever the cause of gelatinization may be, or rather, whatever the substance may be which, when formed, causes gelatinization, my experiments show that no chemist need have gelatinized tincture of kino if he chooses to avoid it. Old ruby kinos should be rejected for the purpose of tincture making. In the case of a member of the Ruby group, if the kino is not completely and readily soluble in cold water, forming a clear ruby solution, with no gelatinous ruby-colored residue of phlobaphene, it should be rejected. My tinctures were made in March, 1888, and perhaps sufficient time has not elapsed to justify one in being dogmatic on the matter, but I will engage to report these samples in another year or two.

The writer has little doubt that this gelatinous looking mass consists wholly or mainly of softened phlobaphenes. By direct experiment he has shown that insoluble phlobaphenes break down after a longer or shorter period of digestion in alcohol, and form the substance already likened to red-currant jelly. The subject will bear further inquiry, but certainly he cannot detect gum, or the somewhat unsatisfactory pectin in the gelatinized mass.—*Phar. Jour. and Trans.*, October 26, 1889.

[1] Cf. *Pharm. Journ.*, i, 399; [3], x, 232.

MINUTES OF THE PHARMACEUTICAL MEETING.

PHILADELPHIA, November 19th, 1889.

The meeting was called to order and Mr. W. B. Webb asked to preside. On motion the reading of the minutes was dispensed with.

The registrar exhibited a *pipette* designed so as to prevent the mixing of liquids which were to be brought together in testing; the line of union of the two liquids could then be distinctly seen by the color occurring at the point of contact. The end of the pipette was curved to a horizontal line so the flow would take place over and not through the lower liquid.

A paper upon *tar* by Mr. R. G. Dunwody, of the present class, was read by him and referred. During the discussion the difference noticed between the tar obtained direct from North Carolina and that refined here for the use of the drug trade was attempted to be accounted for; that tar has a peculiar granular character has long been known and it is nowhere better shown than in *tar ointment;* Mr. J. W. England said, as made by the officinal process of equal parts of tar and suet it inevitably passed into that condition. He found an excellent preventive of that change in the addition of 12·5 per cent. of yellow wax, reducing the suet to 37·5 per cent In detail the pharmacopœia process was followed. Mr. Webb corroborated this statement and said he used wax in the proportion of 8·5 per cent. with satisfaction. Mr. McIntyre asked why the commercial tar should be refined, that as formerly supplied it was satisfactory; it was stated that Mr. Good thought it necessary because sticks, chips, sand and clay were often found in it. The result seems to be that refined tar is not as desirable as the old-fashioned article was. This, Professor Trimble thought, was owing to the process destroying the pyrocatechin and abietinic acid which are components of true tar. Gas or coal tar if added to tar would, it was thought, destroy both these compounds. It was asked if pyroligneous acid would not also destroy these principles. Professor Trimble thought it would. Dr. Lowe said that Mr. Good's statement that coal tar was not added to that he refined was sufficient, and further he thought coal tar more valuable than wood tar, therefore it would not be used as an adulterant.

Mr. G. M. Beringer read a paper upon the *oleates*, tracing their medical history and giving formulas for the preparation of oleates of zinc, lead, copper, mercury and bismuth. The chairman expressed his gratification with the paper; it was characterized by so much painstaking work. Mr. Boring moved a vote of thanks to the author, and said that he regarded the paper as valuable to all who wished to work in the same line. The chairman inquired if the use of oleates was as large as formerly. Several stated they had seen great advantage from their employment. Mr. Brown said they used a good deal in Cooper Hospital, Camden, N. J.

Professor Maisch asked what was the source of the oleic acid used in these experiments, and referring to the instability of oleates of mercury as ordinarily prepared, suggested that this might possibly be due to the oleic acid used being of vegetable origin, which, according to recent investigations, would always contain some linoleic acid, a compound very prone to oxidize. Mr. Beringer said that the red oil of the candle-makers, purified, had been used; that the iodine number of linoleic acid was very high, and that from this test

he judged that the acid was from animal sources, but he could not speak positively.

Some samples of *saffron* were brought to the attention of the meeting, and in a paper read by Mr. Beringer one sample was described as being adulterated with a kind of grass, stained with some coloring-matter, most probably a coal oil color, and weighted with sulphate of calcium, and the other sample to be adulterated with sulphate of sodium. Professor Maisch said these examinations showed that those who followed the trade of adulterating this drug were choosing new substances for sophistication; that while the inorganic salts could be detected by incinerating the drug and testing the ash, if ammonia salts should be used they would be volatilized and therefore not so easily detected. Professor Maisch went on to say that he thought if the dealers who purchased it at first hands from the producers were willing to pay a sufficient price the true saffron could be had without difficulty; that the saffron produced for home use only in Pennsylvania in Lancaster and Lebanon counties is equal to any and that any surplus not needed by the producers was sold for its weight in silver.

Mr. Isaac Cohen, one of our graduates, presented to the meeting some samples of *extract of beef* prepared by Armour & Co., of Chicago. Their claim is that it contains all the albuminoids of beef with the nutrient properties unimpaired, that no chemicals are added, save a portion of chloride of sodium, to render it permanent. Professor Trimble inquired whether the extract was soluble in wine so as to be suitable for making the beef, wine and iron of pharmacy. The reply was that it was suitable for that purpose if a weak sherry was used; that it had been used in Cincinnati in the hospitals there with satisfaction. Mr. Boring wanted to know if the process was secret, whether the apothecary could make it himself in his store. It was stated in reply that the manufacture was not secret, but that the process was not suitable to the facilities of a drug store, as it needed vacuum apparatus and must be performed on a large scale to be economically done.

Mr. McIntyre inquired if any one could say whether the commercial *pills* requiring *aconite extract* were made with extract of aconite root or leaves. The reply was that the dose generally would indicate which, but in the case of Gross' neuralgic pill, which was mentioned, that the English extract of aconite leaf was used. This query lead to discussion, which showed how it was that aconitine was dismissed from the pharmacopœia, as the crystalline alkaloid was so much stronger than the amorphous, that the doses formerly employed of amorphous aconitine would be positively dangerous if the crystalline alkaloid were used.

Professor Maisch stated this was also true of digitalin.

The registrar stated that a paper upon the division of powders in prescriptions was published in the August number of the American Journal of Pharmacy, and a tile was described for facilitating the work. Mr. J. S. Mack, of Slatington, a member of the present class, made a couple of them of slate, with the divisions and figures enamelled on them; these tiles were exhibited to the meeting.

On motion adjourned.

THOS. S. WIEGAND,
Registrar.

EDITORIAL DEPARTMENT.

Commercial Interests.—The Secretary of the Section of Commercial Interests of the American Pharmaceutical Association has announced that the Executive Committee of the Section desires to receive copies of all reports relating on matters of commercial interests, which may have been made to either State or local pharmaceutical associations. Correspondence on these topics should be addressed to F. B. Kilmer, New Brunswick, N. J.

Montreal College of Pharmacy.—From a circular issued by the executive officers of the college we learn that by the laws of the Province of Quebec all licentiates in pharmacy must, before obtaining their licenses, take five courses of lectures, two each on materia medica and chemistry, and one on botany. These laws, passed fourteen years ago, compelled the establishment of the Montreal College of Pharmacy, as none of the medical colleges could furnish the required courses. The college has been kept going by aid from time to time from the city trade, both wholesale and retail, and, as its fee for entrance was a nominal one of two dollars, and the professors were paid directly by the students, it had no chance to extend its sphere of usefulness, but had to be content merely to enable its students to comply with the laws. Since its foundation, over 120 licentiates have graduated, many of whom are scattered over this continent doing good work for pharmacy, and it has at present 60 students on the roll.

The college, aiming to keep abreast with the age, finds its main need to be a proper home, and to meet this, the Board have been actively working, with the result that negotiations are being held for the purchase of a well-situated property on St. Catharine street, which can be readily adapted to college purposes. The sum of $10,000 is required to purchase this, and make needful alterations. Proper and modern equipments are also wanted in the laboratories, class rooms and library, to aid the students successfully to master the daily widening field of studies in connection with their profession. Committees have been canvassing the Montreal pharmacists, and have met with so much success, over $3,500 being promised, that the Board feel encouraged to persevere in their efforts to give the Montreal College of Pharmacy a home of its own. Subscriptions will be thankfully received, and can be sent to Mr. A. Manson, Treasurer, 37 Recollet street, who is authorized to receive them.

Early Closing.—Under the stimulus of sharp competition a number of pharmacists in our larger cities have found it necessary and profitable to keep their places of business open day and night. In the majority of these stores it is probably not so much a strictly pharmaceutical business, but rather the sale of accessories which are generally kept on hand, that enable this extension of business hours to be carried on without pecuniary loss, or even with actual profit. The curtailing of business hours by early closing in the evening, and limiting the Sunday labor to stated hours, which measures have been frequently agitated in past years, has, in the main, been unsuccessful in our large cities. It will be of interest to learn that in the city of Stuttgart, Germany, which, in 1885, had 126,000 inhabitants, all the pharmacies are closed at nine o'clock in the evening since October 1st. As a matter of course, provision has been made for proper night service; but thus far the experience has been that between the

hours of nine and ten the services of the night clerks have been very rarely required, the public generally approving of the earlier closing.

The Louisville Medical Herald has a "Pharmaceutical Department" which has been in charge of and ably conducted by Mr. J. W. Fowler, who now announces that his other duties have been augmented by one of such paramount importance as to compel him to relinquish the editorial chair. The retiring editor has done good work while in charge of the publication indicated, and we trust that, though retiring from editorial labors, he may still find time and occasion for giving the influence of his pen to the cause of pharmacy.

REVIEWS AND BIBLIOGRAPHICAL NOTICES.

The Practice of Pharmacy. A treatise on the modes of making and dispensing officinal, unofficinal and extemporaneous preparations, with descriptions of their properties, uses and doses; intended as a hand-book for pharmacists and physicians and a text book for students. Second edition; enlarged and thoroughly revised. By Joseph P. Remington, Ph.M., F.C.S., Professor of Theory and Practice of Pharmacy, and Director of the Pharmaceutical Laboratory in the Philadelphia College of Pharmacy. With over six hundred illustrations. Philadelphia: J. B. Lippincott Company, 1889. 8vo, pp. 1,300. Price in cloth, $6.00.

We are pleased to announce the publication of the second edition of this work, which makes its appearance four years after the first edition was noticed in this journal. The value of the work was then pointed out, and what was then said about it remains good also for the present edition, which in its general plan and arrangement remains unaltered, but as compared with the former has been increased in size by 220 pages, ten of which belong to the excellent index. The cause of this large increase is pointed out in the preface and is due to the appending to each chapter of a series of questions on the subjects treated of in the chapter, and is intended for the student's self examination; to the insertion, after the chapter on metrology, of typical pharmaceutical problems and exercises in alligation; to the numerous additions made in Part V, on "Magistral Pharmacy;" and to the incorporation, in Part VI, of the formulas of the National Formulary, and of others that appeared to be desirable. The former of these are distinguished from the others by the affix N. F. and by the numbers assigned to them in this publication; but they are arranged with the other formulas under the heads of their chief or characteristic constituents. A very interesting subject for study and reflection is presented by the autograph prescriptions illustrated by one hundred fac similes, the originals of which appear to have been collected from different parts of the country, and selected for some commendable, erroneous or doubtful qualities. These prescriptions and the accompanying text have been printed upon enameled paper in order to preserve the charactristics of the writing.

In its new garb the "Practice of Pharmacy" will prove as useful as heretofore, and in addition to its former will secure many new friends.

Proceedings of State Pharmaceutical Associations.

The following printed Proceedings have been received:

Iowa.—Tenth annual meeting, pp. 96.—See page 537.
New Jersey.—Nineteenth annual meeting, pp. 113.—See page 318.
New York.—Eleventh annual meeting, pp. 216.—See page 538.
Texas.—Tenth annual meeting, pp. 47.—See page 380.

Wandtafeln zur Mikroskopie der Nahrungs- und Genussmittel aus dem Pflanzenreiche. Von Docent Dr. Josef Nevinny, Assistent der Lehrkanzel für Pharmakologie und Pharmakognosie an der Wiener Universität. Gezeichnet von Dr. C. Henning. I. Lieferung. Wien: Alfred Hölder. 1889.

Charts on the microscopy of the articles of nourishment and food derived from the vegetable kingdom.

This is the first instalment of a work intended to illustrate the structural characteristics of such vegetable substances, which are used as food, or are employed for the adulteration of the same. The size of the charts being 59x86 centimeters, they afford ample room for the illustration of the important anatomical elements of each article of such a size as to be useful for class instruction. Many of the articles selected for illustration are medicinally employed, like taraxacum, ginger, cinnamon, cloves, pepper, capsicum, figs, staranise, flaxseed, almonds, nutmeg, mustard, ergot, etc.; the remainder are important articles of consumption, like tea, coffee, cacao, the cereals, beans, peas, etc., or like some of the drugs named above, or like date seeds, palm kernels, etc., are employed for the adulteration of spices or food. Examinations of articles of daily use by means of the microscope, with the view of establishing their identity and purity, are regarded as important adjuncts of chemical investigations for the objects stated; in fact microscopical researches are continually being extended in most lines of research, and microscopy, as such, is fast occupying the ground for becoming a distinct discipline of a scientific or liberal education. The work, a portion of which is now before us, is intended—in part at least—to further this evolution in one branch of research. The author, who is assistant to the chair of pharmacology and pharmacognosy at the University of Vienna, has selected the material, with good judgment, from preparations made by himself, and the drawings have been accurately and artistically made by Dr. Henning. The four charts now before us leave nothing to desire in regard to the objects in view. The parts containing four such charts, and costing eight marks each, will be issued at intervals, so that the entire work, which, for the present, is limited to sixty such plates, will be in the hands of subscribers in about two years, when it is contemplated to publish, as accompanying text, a hand-bood on the same subject. To judge from the first part now before us, the work deserves the attention of the teachers on microscopy and of pharmacognosy, and of all those who are interested in the examination of food by means of the microscope.

Foods and Food Adulterants.—Investigations made under direction of Dr. H. W. Wiley, Chief Chemist. Part V. Baking powders. By C. A. Crampton, Analytical Chemist. Pp. 560–628.

Issued as a part of Bulletin 13 of the U. S. Department of Agriculture, Division of Chemistry, the pamphlet has accomplished a very good result in showing the inferior quality of some of the commercial baking powders. A formula is given for a baking powder of a better than the average quality and which can

be readily prepared at a moderate cost; the proportions are cream of tartar 8, baking soda 4, and corn starch 4 parts.

Record of Experiments at Sugar Experiment Stations. Bulletins 22 and 23, U. S. Department of Agriculture, Division of Chemistry.

The former of these pamphlets refers to the Des Lignes station at Baldwin, La., and the latter to Calumet Plantation at Pattersonville, La.

Composition of Sorghum Seed with reference to its feeding value.

Influence of Food, Animal Idiosyncrasy and Breed on the Composition of Butter.

Two pamphlets containing papers read before the Society for the Promotion of Agricultural Science at its tenth meeting in Toronto in August last, by H. W. Wiley, Chief Chemist of the Department of Agriculture.

Proceedings of the Sixth Annual Convention of the National Confectioners' Association of the United States. Philadelphia: Confectioners' Journal Print. 1889. 12mo, pp. 143.

The convention was held in New York, commencing July 9, 1889.

OBITUARY.

Edward B. Garrigues, the last survivor of the original members of the Philadelphia College of Pharmacy, died in this city November 3d, in the ninety-fifth year of his age. He was the father of Dr. Samuel S. Garrigues, whose death was announced in our June number. During the early history of the College he took an active interest in its affairs, rendering services on committees and as an officer of the institution. A sketch of his life is being prepared by the committee on deceased members, and will appear in a future issue.

Reinhold F. W. Rother, prominent as a writer on pharmaceutical subjects, died in Detroit, October 18, 1889, a disease of the brain being the immediate cause of his death. He was born in Landau, Silesia, in 1843, and at the age of six years came to America, his parents settling in Monroe, Mich., where Reinhold was educated, graduating from the High School. He learned the drug business at Ann Arbor, graduated in 1867 as pharmaceutical chemist from the University of Michigan, and afterward clerked in Chicago, remaining with Mr. A. E. Ebert for about eight years, during which time he wrote numerous papers for the Chicago "Pharmacist." Later on his prolific pen contributed also many papers to this and to other pharmaceutical journals. Since 1876 he was in business in Detroit, until a few years ago failing health compelled him to relinquish business. His writings, including the two works, "Beginnings in Pharmacy" and "Chemistry of Pharmacy," noticed in these pages somewhat over a year ago, are characterized by philosophical reasonings, and though often somewhat cumbersome in style, bore the stamp of scientific training, close observation, and original thought, as a rule directed to practical application. His love for, and interest in, scientific research was not confined to his writings, but was manifested also in various other ways. Thus, about five years ago he donated to the Philadelphia College of Pharmacy the sum of $500 to be applied to original chemical research, which was done with his

advice and consent, and to the Chicago College of Pharmacy he conveyed some real estate which at the present time is valued at about $10,000. Mr. Rother was not married; his mother survives him.

Frederick A. Tilge, Ph. G., died in Germantown, Philadelphia, November 10, 1889, of pneumonia, aged 47 years. He was born in this city, learned the drug business with the firm of Fred. Brown, graduated in 1863, and then started in business with his brother George as importers of druggists' sundries. A few years ago he connected himself with the firm of Henry Tilge & Co., hatters, the senior member being his father, who died four days before the son.

Joseph Wiley, Ph. G., was killed by the explosion of "flash powder" at his place of business on North Seventh street, Philadelphia, November 11th, 1889. He learned the drug business with the firm of W. R. Warner & Co., of whose manufacturing department he had been in charge for some time. He graduated from the Philadelphia College of Pharmacy in 1872, afterwards was in business as a pharmacist, and for about eight years as a wholesale druggist and manufacturer, the firm name being finally Wiley & Wallace. Several accidents having occurred through the explosion of "flash powder"—a combination of powdered magnesium with oxidizing agents, Mr. Wiley was engaged in making preparations for removing from the premises the last portions of the explosive stock, when the same exploded, instantly killing him and his two assistants.

Chas. Wesley Rinedoller, Ph. G., a native of Philadelphia, was an apprentice in the store of Dr. C. G. Frowert, graduated in pharmacy in 1887, and subsequently had charge of the chemical manufacturing department of the firm of Wiley & Wallace, when he was killed by the explosion mentioned before.

Rudolph Littmann, the third victim of this explosion, was a student of the Philadelphia College of Pharmacy, and had attended the lectures and examinations up to Saturday preceding his death. At a meeting of the class his fellow-students passed the following resolutions:

Whereas it has pleased the All-wise Providence to remove from our midst, by a most distressing casualty, Rudolph Littmann, one of the members of the Junior Class of 1889 and '90 of the Philadelphia College of Pharmacy; it is therefore,

Resolved, by his Classmates, That in bowing to the will of the Almighty, we recognize the affliction that has befallen us, and tender to his family and friends our heartfelt sympathy.

Resolved, That a copy of these resolutions be engrossed and sent to the family of our deceased Classmate, and that they be published in the AMERICAN JOURNAL OF PHARMACY and daily papers.

CLARENCE W. ELSTON,
EDWARD T. N. STEIN,
C. E. KITCHEN,
C. EUGENE LACK,
W. O. BRICE,
Committee.

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TO VOL. LXI (VOL. XIX, FOURTH SERIES), OF THE AMERICAN JOURNAL OF PHARMACY.

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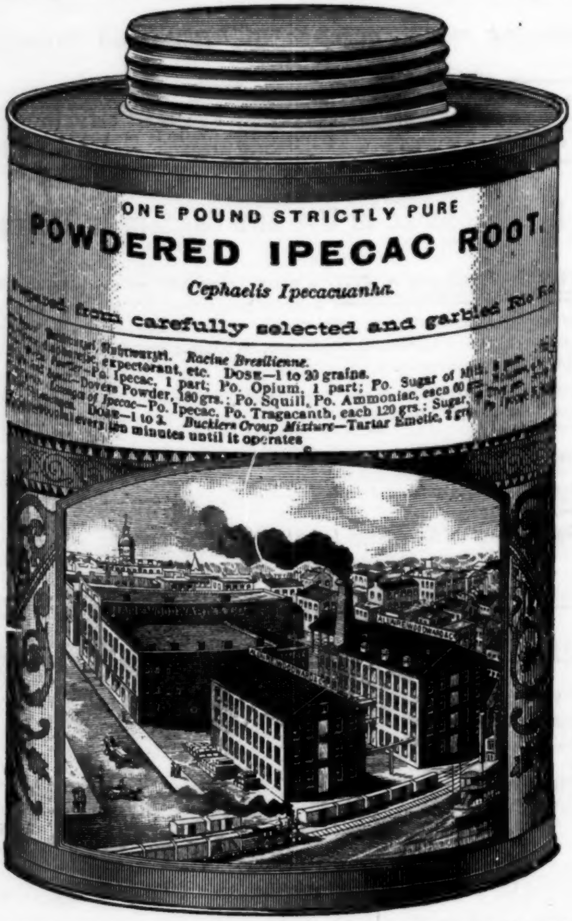

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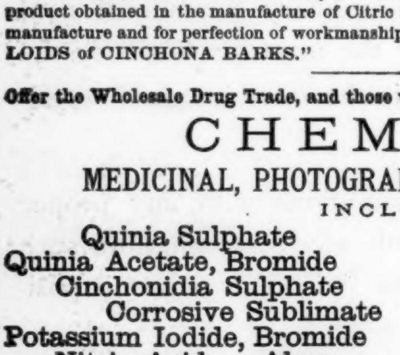

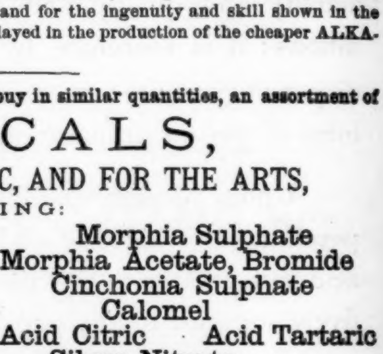

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CONTENTS

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10	Morphinæ Sulphas 1-6 grain, Atropinæ Sulphas 1-180 grain	1 30	60
11	Morphinæ Sulphas 1-8 grain, Atropinæ Sulphas 1-200 grain	1 20	55
12	Morphinæ Sulphas 1-12 grain, Atropinæ Sulphas 1-250 grain	1 10	50
13	Atropinæ Sulphas 1-60 grain	1 00	45
14	Atropinæ Sulphas 1-100 grain	1 00	45
15	Atropinæ Sulphas 1-150 grain	1 00	45
16	Strychninæ Sulphas 1-60 grain	1 00	45
17	Strychninæ Sulphas 1-100 grain	1 00	45
18	Strychninæ Sulphas 1-150 grain	1 00	45
19	Apomorph. Mur. 1-10 grain	2 00	90
20	Apomorph. Mur. 1-20 grain	1 50	70
21	Pilocarpinæ Mur. 1-4 grain	3 50	1 60
22	Pilocarpinæ Mur. 1-8 grain	2 00	90
23	Pilocarpinæ Mur. 1-20 grain	1 50	70
24	Pilocarpinæ Mur. 1-2 grain	6 00	2 70
25	Pilocarpinæ Mur. 1-3 grain	4 50	2 00
26	Pilocarpinæ Mur. 1-10 grain	1 80	80
27	Aconitinæ 1-60 grain	2 40	1 10
28	Aconitinæ 1-130 grain	1 50	70
29	Aconitinæ 1-260 grain	1 20	55
30	Morph. Bi-Meconas 1-3 grain	2 40	1 10
31	Morph. Bi-Meconas 1-4 grain	2 00	90
32	Morph. Bi-Meconas 1-6 grain	1 60	70
33	Morph. Bi-Meconas 1-8 grain	1 20	55
34	Hydrarg. Chlor. Corros. 1-30 gr.	1 00	45
35	Hydrarg. Chlor. Corros. 1-60 gr.	1 00	45
36	Digitalini 1-100 grain	1 00	45
37	Atropinæ Sulphas 1-200 grain	$1 00	$ 45
38	Cocainæ Hydrochlor. 1-6 grain	2 40	1 10
39	Cocainæ Hydrochlor. 1-8 grain	2 00	90
40	Cocainæ Hydrochlor. 1-10 grain	1 50	70
41	Duboisinæ Hydrochlor. 1-60 gr.	1 10	50
42	Duboisinæ Hydrochlor. 1-100 gr.	1 00	45
43	Duboisinæ Hydrochlor. 1-60 gr., Morphinæ Sulph. 1-4 grain	1 80	80
44	Duboisinæ Hydrochlor. 1-100 gr., Morphinæ Sulph. 1-8 grain	1 20	55
45	Hyoscyaminæ Sulph 1-60 grain	1 20	55
46	Hyoscyaminæ Sulph. 1-100 grain	1 20	55
47	Hyoscyaminæ Sulph. 1-60 grain, Morphinæ Sulph. 1-4 grain	2 00	90
48	Picrotoxini 1-40 grain	1 00	45
49	Picrotoxini 1-60 grain	1 00	45
50	Picrotoxini 1-80 grain, Strych. Sulph. 1-80 grain	1 00	45
51	Coninæ Hydrobrom. 1-80 grain	1 00	45
52	Coninæ Hydrobrom. 1-100 grain	1 00	45
53	Coninæ Hydrobrom. 1-100 grain, Morphinæ Sulph. 1-6 grain	1 20	55
54	Curarinæ Sulph. 1-60 grain	1 20	55
55	Curarinæ Sulph. 1-80 grain	1 00	45
56	Curarinæ Sulph. 1-100 grain	1 00	45
57	Eserinæ Sulph. 1-60 grain	1 50	70
58	Eserinæ Sulph. 1-80 grain	1 20	55
59	Eserinæ Sulph. 1-100 grain	1 20	55
60	Eserinæ Sulph. 1-100 grai. Morphinæ Sulph. 1-6 grain	[illegible] 50	70
61	Physostigminæ Salicylas 1-40 gr.	1 50	70
62	Physostigminæ Salicylas 1-60 gr.	1 20	55
63	Caffeinæ 1-2 grain	1 20	55
64	Caffeinæ 1 grain	1 80	80
65	Quin. Carbam. Mur. 1 grain	2 00	90
66	Quin. Carbam. Mur. 2 grain	3 50	1 60
67	Quin. Carbam. Mur. 3 grain	4 50	2 00
68	Hyoscin Hydrobrom. 1-100 grain	3 50	1 60
69	Hyoscin Hydrobrom. 1-50 grain	6 00	2 75
70	Spartein Sulphas 1-30 grain	1 00	45
71	Spartein Sulphas 1-60 grain	1 00	45

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